





22500114382







Verf. & Dr. L. K. K. K. 280

Coleman The London School 76

Coleman on the Road 76

Edinburgh J.R.V. London 74

Demotischer Re. Stände  
2. Weltk. Krieg.

nothing

Deeds with the records of Oliver

*Epomis marked.*

deals with the General Questions  
Men before the public &  
historical notes.

Disposes of Admiral Poyas



James Mack 141  
Rebut Pembroke a Army Farmer 139  
31 Hunt Horses Breeding

## 671 Early Veterinary Literature

23. 80 Physiology of the Horses

102 Horse Breeding for the Hunt in  
Scotland

109

Stable Work & Saddle 6 158

--- 157 Breeding Horses

172

Stable --- 341 Rearing as an incentive to  
Breeding

399 Determination of Horses in Ireland

Stable to Horses 419

Stable to  
Horse 427

--- 449 Breeding Management of Horses

492 Admired Horses on Race Horses

moderate 496 Breed of Hunt Horses

497

unimportant 543 Discussions on Horse Breeding

587 Observation on the English Blood  
Horses

meets his  
Critics 655 The Breeding Management of  
Horses















EDINBURGH  
VETERINARY REVIEW

AND

ANNALS OF COMPARATIVE PATHOLOGY.

VOLUME VI.—1864.



EDINBURGH:  
MACLACHLAN & STEWART, 64 SOUTH BRIDGE.  
LONDON: SIMPKIN, MARSHALL, AND CO.

MDCCCLXIV.





WELLCH

WELLCH

WELLCH

WELLCH

WELLCOME INSTITUTE LIBRARY	
Coll.	Wellcome
Coll.	
No.	

WELLCOME INSTITUTE

WELLCOME INSTITUTE

WELLCOME



# EDINBURGH VETERINARY REVIEW

AND

## Annals of Comparative Pathology.

---

### ORIGINAL COMMUNICATIONS AND CASES.

---

*Parturient Apoplexy and Metro-peritonitis; being an Essay read at a meeting of the Veterinary Medical Association, Edinburgh, in connection with the New Veterinary College, in February 1863.*  
By ROBERT WATSON.

MR CHAIRMAN AND GENTLEMEN,—If any apology is required or explanation expected for bringing under your notice the above-named disease, it is to be found in the importance we attach to the malady itself; the frequency of its occurrence at certain seasons, and in particular localities; the fatality of its termination, and erroneous views generally entertained as to its nature—not to mention the many unsatisfactory modes of treatment which have been recommended by not a few veterinary writers. The term puerperal is derived from the Latin “*puer*, a child,” and “*parere*, to bring forth;” consequently, puerperal fever literally signifies any fever occurring at the period of parturition. By general consent, however, in human medicine the term is confined to a particular specific or malignant form of peritonitis occurring at parturition. In veterinary medicine we find that the term has been employed in a somewhat extended sense. In addition to this particular inflammation of the mucous and serous contents of the abdomen, it has been made to embrace a particular diseased condition of the great nervous centres, or to a diseased condition in which both these great systems seem implicated. To the first of these affections I here desire to restrict the term puerperal fever, giving to the other, which we are certain does occur independently, the more distinctive appellation of parturient apoplexy. Not that I mean to assert that in no instance do we find both of these systems, the abdominal and nervous, involved.

But, before addressing ourselves to the detailed consideration of these different forms of puerperal fever, I would rather desire merely to draw attention to the fact, that other diseases of very dissimilar nature and terminations may be confounded with this more



fatal affection, and especially if occurring in connection with parturition. There are, however, if observation be at all carefully employed, very distinctive differences between any form of this and the most analogous of these maladies.

*Loin fallen* occurring, as it not unfrequently does shortly after parturition, presents, in common with puerperal fever, the symptoms of paralysis of the hind extremities; this is, however, the only common feature, as, apart from the inability to rise, the animal shows little or no constitutional disturbance. There is no coma or wild tossings of the head, and in the majority of cases no perceptible alteration of the pulse; while, by acting upon the primary source of the affection, the stomach and intestinal canal, through means of a brisk cathartic combined with stimulants, we generally restore to the animal the power of locomotion. In a similar manner do we distinguish that form of paraplegia or paralysis resulting from undue exposure, in which, as in the other, the only common feature with puerperal fever is the impaired or lost mobility of the posterior extremities.

In further treating of the subject, I shall notice, first, that form of puerperal fever more properly designated parturient apoplexy, as this is the form we most frequently meet with as an independent affection; secondly, that manifestation of the disease, puerperal fever proper or puerperal metro-peritonitis, where the abdominal viscera are more particularly the seat of disease; and lastly, should time permit, notice those cases where both these forms may be seen combined.

First, then, as to parturient apoplexy, which, as I have already remarked, is found to occur independently of any other morbid condition—that is, the only organ or set of organs involved in the disease, and exhibiting characteristic changes after death, are the cerebral, or more properly, the great centres of nervous influence. It seems to merit the designation apoplexy from these lesions having resemblance to, or being identical with, those showing themselves on the occurrence of apoplexy proper. Of course, the qualifying term Parturient plainly enough should indicate the condition in which we expect these cerebral changes, which I shall more particularly notice in treating of the appearances after death in those cases which terminate fatally.

It may not be confounded with true or phrenic apoplexy, not so much on account of a distinct train of symptoms attendant on its development, as from those symptoms being concomitant with the puerperal state. It is, moreover, a common affection; whereas we are not aware that true or phrenic apoplexy is at all common amongst cows.

It exhibits no partiality as to breeds,—all are alike impressible when in those conditions favourable to its development at the time of parturition; these, experience has shown to be, that which theory can interpret to be a plethoric state of the system—cows in good



condition at this excitable period being more predisposed to it, more so in warm than in cold weather, and more especially those famed for their milking qualities. Age, as I shall presently notice, has also a considerable influence in the malady. It never follows abortion or retention of the placenta; never, I may say, occurs at the first or second calving, or in bad milkers; rarely if ever follows a difficult parturition, and never in those having uterine hæmorrhage; there must be, therefore, as a principal predisposing cause, a highly vascular state of the system. It occurs generally after an easy parturition; it may be at the third, but most commonly not until the fourth or fifth, when the animal is six or seven years old, and in the prime of life. The cow is now fully grown; there is a larger volume of blood in the system than formerly, and there is not now the demand for this material there existed while the animal was younger, and in a growing condition; what blood was then required for the building up of the tissues is no longer requisite, the frame-work having reached its maximum, and the only other process going on requiring this fluid is the repairing of the waste these tissues undergo. The surplus must inevitably be disposed off in some other way; and thus we find it laid up as fat, or poured off through the secretion of the udder. Added to all this, after parturition the blood formerly employed for the nourishment of the foetus in utero is determined to the udder for the elaboration of nutriment for the support of the young animal. Should, however, this flow of blood to the udder receive a check, or be obstructed in its natural course, as from disordered digestion, cold, or any such like infringing causes, this additional excess of blood being in the system, consequently must go somewhere; in this disease we find it determined to the brain and larger nervous centres. At this period the whole system is more excitable, and especially these centres. In short, the brain and spinal cord are implicated in the act of parturition, and we know it to be one of those never-failing physiological axioms, one worthy ever to be borne in mind, that any organ or set of organs in a state of excitation takes disease more rapidly than otherwise. We are also aware that the brain cannot bear up against a great flow of blood; these, the centres of the nervous system giving way first, from being excited, predisposes them to still more excitement. These centres may have been healthy up to this time, but now, from an undue determination of blood to these excitable parts, they become diseased,—they become congested.

Hence follows the well-known characteristic and unmistakable symptoms of parturient apoplexy. These may exhibit themselves in a comparatively short space of time, or may be delayed a considerable period after the act of parturition, the earlier the more fatal, the longer the less so; in the majority of cases it occurs within the week following the aforesaid occurrence. Symptoms may present themselves as early as three to four hours after the act in some instances, and in others as many days may supervene before these



become manifest. Striking an average of the few cases I have had an opportunity of witnessing, I find it from twenty-four to forty-eight hours subsequent to calving.

So common and familiar to all are the symptoms of this important and rather fatal affection, that were it not for the "epithet" of my paper, "An Essay," and the younger members on the benches, I should have omitted them altogether, for the purpose of leaving more time, for what some of you may consider of more value—the individual discussion of the subject. I shall therefore run over these, taking them in the following order: premonitory or earliest symptoms—and how developed; and change of these on change of organic conditions, as those during congestion and symptoms after effusion, connecting symptoms as much as possible with change of organism.

With regard to premonitory symptoms, it is scarcely proper, in many cases, to talk of such; as the first indication in these is the total paralysis of the animal. Still, in the majority of instances, those first noticeable may be specified as follows (perceiving that the cow has calved):—A general disturbance of the system, with gradual and increasing coma or stupor; staggering, partial or total suspension of the lacteal secretion, mastication and rumination, pulse full and strong; the head and horns distinctly hot; the extremities cold; the eyes prominent and staring, glassy looking, with the pupils dilated; the sight not lost at this stage, but impaired—not that of a healthy cow; the visible mucous membranes not much altered at first, but gradually becoming of a purple hue from congestion; she seems uneasy, but not with that expression of real pain; shakes her head as if something troubled her ears, and reels when made to walk. If she lies down she rises with difficulty, or not without assistance. There may have been no evacuation for some hours, the bowels invariably constipated, and frequently a marked tendency to gaseous evolution in the rumen (depending much upon the nature of the ingesta at the time contained within that organ), never so demonstrable, however, as in the second stage.

These symptoms will pass off, and others considerably different will take their place, the cow will now come to the ground, most probably not to rise again; here it is to be remarked, that it is only during the development of these symptoms just noted, which may occupy only a few hours, or even less, that any confidence can be placed in the adoption of curative measures. The blood is still confined to its allotted vessels; effusion has not yet taken place, it is only the stage of congestion. When this is past and effusion has commenced, the cow comes to the ground from the shock to the system, and want of motor power in the extremities; all the foregoing symptoms become increased; they now indicate a lesion of a much more serious character; the pulse becomes quicker and distinctly less in volume; the cow dashes her head about, or lies with it turned round, resting upon her shoulder; the breathing becomes slow and stertor-



ous ; the eyes amaurotic, the pupils, previously dilated, now become contracted, and the visible mucous membranes are of a darker hue. The udder wants the natural flaccidity of a healthy cow. The brain seems gone as to its functions ; it, together with the larger nervous centres, being pressed upon, perform their functions in consequence eccentrically, which is evident not only by the lessening of the excretions, but also, as we have already heard, from the want of motor power in the extremities, coupled, as we shall presently hear, with other apparent results.

There is also constipation : this, if not invariably the exciting cause, is at least the never-failing accompaniment of the disease ; but in this stage it is of a much more serious nature, and more difficult to combat than formerly. There is diminished action, partial or total paralysis, in short, of the muscular coats of the intestines, and probably want of secretion from the mucous membrane. At length the cow becomes totally comatose, perfectly unconscious, and seems to feel little ; sensation is partially or wholly gone ; pulse now all but imperceptible ; eyes sunk, and cornea somewhat opaque ; she grates her teeth, saliva trickles from the mouth ; she cannot swallow, the muscles of deglutition are partially paralysed ; if liquids be administered without the probang, part of them may pass into the wind-pipe, and cause suffocation. In some cases the lower jaw drops and the tongue protrudes ; gaseous distention of the rumen is generally well marked, with occasional eructation, and the surface of the body cold ; all these symptoms may be developed in a short space of time, and if so, the case is generally hopeless. Prompt and active treatment having failed, or not having been applied, death follows as the result of effusion or extravasation upon the medulla oblongata, thereby causing paralysis not only of the muscles of respiration, but also of the heart itself.

But let us now consider for a little the “ Cadaveric lesions,” by understanding which we will the more readily comprehend physiologically the relation between symptoms and disease. In the first stages of this malady we would expect enormous congestions of various organs, but more especially the brain ; using the word expect here, as it is rare that we have the affected animal dying in the first stages. Connecting these with those symptoms we designated premonitory—coma, staggering, &c.—plainly shows us, that the disease under consideration commences first in the brain proper. Blood, then, if determined to the brain, causes congestion, and if not checked, either becomes extravasated in whole or in part—*i.e.*, either the serum or the blood itself—in clots upon the pia-mater, which is evident in the further advanced stages, or in those in which the animal succumbs to the malady ; together with these congestions, we find effusions of serum at the base of the brain, in the ventricles, on the medulla oblongata, and not unfrequently on the cervical portion of the spinal cord. Moreover, in the place of the effusion at the base of the brain and medulla oblongata, more especially



if symptoms and death have occurred rapidly, we find extravasations of blood.

Here, again, referring to the secondary symptoms in which we have paralysis, profound coma or total unconsciousness, &c., is explained to us physiologically how these symptoms are produced—simply from pressure upon the brain and larger nervous centres. The lungs are almost always congested, and, if the cow has lain upon one side, the lung on that side will appear more congested than its fellow. Should the medicines have been administered without the probang in the stage of unconsciousness, we invariably find inflammation of the lower lobes of these organs. The right side of the heart and larger venous trunks contain dark grumous blood—naturally dark, no doubt, but considerably darker than it should be, and which does not appear to separate into its proper constituents. Sometimes there are to be observed dark spots upon the pleura, which, by the inexperienced eye, are frequently mistaken for inflammation, but which depend upon the blood, or rather its colouring principle, oozing through the coats of the vessels.

Autopsy of the abdomen discloses nothing of any consideration, saving that the semilunar ganglion is somewhat congested, showing plainly that it is also involved in the disease. Sometimes there are spots of ecchymosis upon the mesentery and mucous membrane of the intestines, with more or less food in the stomach, and the contents of the canal may be of any degree of consistency. The liver and spleen are frequently congested, and the gall bladder generally filled with bile; the uterus is still somewhat dilated, time not having been allowed for its proper contraction. There is no inflammation of the latter in the pure form of parturient apoplexy, but it generally contains a quantity of straw-coloured fluid, and its lining membrane is of a yellowish hue. The urinary bladder is full, if not emptied with the catheter during life.

Having thus shortly occupied your attention with the nature, causes, and *post-mortem* appearances of the disease, and explained as fully as possible why such changes of parts and organisms are liable to occur in cows at this time, we are now prepared to enter upon that part of our subject in which our assistance will not unfrequently be sought, viz.—

#### TREATMENT.

This must be adapted to the stage of the malady and symptoms exhibited. The treatment that might be appropriate during the congestive stage, when we find the pulse full and strong, the animal standing, and the powers of locomotion not much impaired, would be decidedly injurious so far, if put in force when effusion has taken place, which, in the majority of instances, is found to be the case when the animal has become recumbent. Perceiving the nature of this disease, we can readily understand how that treatment,



in order to be successful, must not only be energetic but early applied. In all those cases where the powers of motion are still intact, and it may be in a few of those in which the animals have only recently come to the ground, we will find the pulse full and strong. In all these copious blood-letting is the first step to be adopted; "one or both jugular veins," as Mr Hunting of South Hetton has remarked, "are to be opened;" probably both is preferable to one, as, in abstracting blood from one the pressure necessary to maintain the flow of blood by the cord is also productive of obstruction in the cranial circulation to some extent, by preventing the return of blood in the other,—we also get a more prompt and powerful effect upon the system. In bleeding, we must not be guided by the amount abstracted, whether it be in ounces, quarts, or gallons, but by its effects; it is well, therefore, to watch these, keeping the finger over the submaxillary artery, which gradually diminishes in volume and strength; should, however, the pulse become irregular, or the animal evince signs of nausea, the venesection must at once be discontinued.

The intestinal canal must be early attended to, and whether the evacuations have been hard or soft, they will invariably have been small in quantity. A smart dose of purgative medicine must be given, and this must be commensurate to the condition of the canal, which is in a state of considerable torpor; a free evacuation is desirable, nay, it is absolutely necessary to a recovery. Twelve ounces of the sulphate of magnesia with an ounce each of gentian and ginger, will not suit our purpose here. Give one pound of the sulphate of magnesia, with fifteen to twenty croton beans powdered, one or two drachms of calomel, and half a pound of treacle amongst a considerable quantity of warm linseed tea or gruel,—assisting its action by giving at intervals warm diluents containing mild stimulants, never forgetting the important employment of enemata. Some have proposed turpentine, and others the ordinary enema of water and soap; however, I should not recommend either of them, knowing that we can obtain the same beneficial effects without causing any additional irritation, by following the advice of our worthy Professor, and using the simple tepid water injection. Although probably some of you may consider it out of place, yet I cannot pass over it without strongly condemning the too often resorted to practice of pumping into the intestines whole gallons of a strong alkaline fluid, with all the strength an individual is able to bring to bear on the apparatus,—I allude to the old barrel syringe. No, gentlemen, a far more rational and a far more efficacious instrument is the Gamgee enema funnel, for which, as also much else of incalculable theoretic and practical benefit, the profession is indebted to that veteran, Professor Gamgee, senior, but to whose more able advocacy and explanation I shall leave this item.

Immediately after the bleeding and administration of the purgative medicine, the head, or rather the poll and back part of the



neck, had better be swathed in woollen cloths, to be kept as cold as possible for some hours, when, if necessary, these may be removed to have a smart blister applied. I say if necessary, as not unfrequently the prompt employment of those other and earlier remedies has sufficed to arrest the disease. Very little more can be done for some hours, always, however, keeping in view the assisting of the bowels by warm diluents, mild stimulants, and enemata; while, if no amelioration of symptoms appear in three to four hours, the cold dressing we applied to the head at the outset had better be removed, and a smart blister take its place,—made to extend at least from ear to ear, and six or eight inches backwards from the poll. Mustard may be employed in two or three successive cataplasms, but a liniment of cantharides and croton oil is preferable; its action is prompt, which is what we desire, producing great effusion and rapid discharge. So essential and important is a free evacuation of the bowels to recovery of the animal, that if there appear no signs of the cathartic acting within seven or eight hours, the half of the former dose may be repeated with advantage.

Here, gentlemen, as I have no doubt some of you may be inquiring, or at least speculating, as to the *modus operandi* of this treatment, it may probably be better shortly to give you what I consider a sensible reason why all this is done. By some it has been asserted that the curative action of blood-letting operates in those cases of phrenic congestion by the direct lessening of the amount of circulating fluid within the vessels of the brain or cranial cavity; by others, again, this is flatly denied. Here it would be needless to enter at length into the various arguments urged by the supporters of these adverse theories; suffice it to say, that we are rather inclined to the opinion, that it does not so much depend on the removal of so much blood from the cranial circulation, if such is at all possible, as by the immediate action of this withdrawal of circulating fluid on the centre of the circulation—the heart—by which the force or nature of the cranial circulation is entirely altered. Thus it is that it will be found necessary to abstract not a small amount of blood, which we might suppose would be the case did the venesection operate in the first of the methods alluded to, but such a quantity as will at once and visibly affect the action of the heart. This withdrawal of blood also favours absorption from the intestinal canal, thus facilitating the action of the medicines administered.

The cathartic operates by removing an irritant from the canal, in the shape of the faecal matter therein contained, and overcoming the torpid condition of the bowels, as also as a derivative and nauseant, directing large quantities of blood and nervous influence to the intestinal mucous membrane, employing and acting upon the vital fluid in such a manner as will tend considerably to the restoration of functions in those organs now in a state of disease.

In addition to this general outline of the treatment I have indicated, there are other matters which, although in appearance trifling,



still tend much to favour the more important measures. These may be all included in the injunction to attend to the general comfort of the animal, allow her a sufficient supply of fresh air, have her body well clothed and covered up, by which the action of the skin is promoted ; keep her on her sternum, or change her now and again off one side on to the other ; this not only favours the action of the medicines, but often tends to relieve the hoven when present ; hand-rub, foment, and draw the milk (colostrum) from the udder at frequent intervals ; hand-rub and bandage the legs, for the purpose of equalising the circulation. Should she show any inclination to drink, allow her moderately warm gruel, but no solid food, should she manifest any predilection for it.

In those cases in which we find the animal down, little hope is to be entertained, in the majority, of recovery ; from the nature of the pulse, which has now lost its fullness and strength, becoming gradually more and more indistinct, and at length all but imperceptible, this, together with the symptoms already referred to, lead us to suspect that effusion or extravasation has taken place. Here I need scarcely tell you that abstracting blood in this, or in any disease, after such organic lesions, would be quite out of the bounds of physiological reasoning ; in short, you would kill your patient, or at least hasten this termination. She has been bled enough from the effusion and sudden shock to the system ; taking away blood, therefore, will not take away the effused materials, but only deprive the system of that which is left to cause reaction ; moreover, although in the great majority of cases in which the animal has come to the ground, effusion has taken place, yet never in any instance must we allow ourselves to be governed by such a symptom alone, whether we ought to abstract blood or not, but let the nature of the pulse be the axis on which we revolve our scruples.

The treatment in this stage differs but little in appearance from the preceding ; but from what has been said in the foregoing pages, it must differ materially in the chances now left for the animal's recovery. The bleeding must be abandoned, and a strong dose of cathartic medicine be our first resource ; for unless we get the bowels to act, the disease will cut the animal off. Apply active counter-irritants to the nape of the neck and stimulate the spine ; give stimulants internally, such as the liquor ammoniæ, or the aromatic spirit of ammonia in combination with spirit of nitrous ether, given frequently. They not only assist the action of the purgative by stimulating the stomach and intestinal canal, and support the system to bear up against this dreadful malady, but also tend considerably to alleviate the proneness to gaseous evolution in the rumen invariably attendant on this stage, neutralising or combining with the gases formed. One precaution, which it is always necessary to keep in mind in administering these fluid medicines is, that there is partial paralysis of the muscles of deglutition ; and let us take whatever caution we may, we run the risk of the little hope



there is generally entertained at this stage of her recovery being cut off. The fluid, as I have before had occasion to remark, may pass into the trachea, thence to the bronchial tubes, causing suffocation, or a state of spasm resulting in instant death. We should therefore, in the stage of unconsciousness, without exposing ourselves to this sometimes fatal occurrence, together with the ignominy we would likely receive from onlookers, take the sure and safe method of procedure in "using the probang or stomach-pump. Examine *per vagina* the condition of the bladder; empty the viscus, if full, by passing a catheter, as there is invariably retention of the urine; assisting the purgative by enemata, and following up with what has been noted in the injunction to attend to the general comfort of the animal. Should the patient recover, food of a nutritious kind, but small in quantity, and of such a nature as will tend to keep the bowels open, should be allowed her, especially for some time, keeping free from exposure to cold, &c.," which, from the prompt and active measures that have been adopted, together with the debilitating nature of the malady, predisposes the animal to other alike fatal affections.

*Prevention.*—Preventive measures are, in this disease, as in many others, better and easier than cure. Some, however, question the efficacy of these; but experience has shown, and theory elucidates the *modus operandi* of these important measures so fully, that we cannot for one moment doubt them. In order, then, to accomplish our end, we must overcome that state of the system at that critical period of the animal's life which predisposes or induces this disease; that condition, as we all know, and as I have previously stated, is the plethoric—parturition only being the determining cause. One flaw in the animal's economy at this period may act as the direct agent of the blood being repressed in its natural course and directed to those parts which, from their *post-mortem* appearances, have given the appellation of Parturient Apoplexy to this disease.

We can therefore do much in order to counteract this predisposition, by administering cathartics and diuretics; giving a full dose of the sulphate of magnesia ten or twelve days previous to calving, and in the interval mild laxatives or diuretics, when, if thought necessary, a second dose of the sulphate may be given two or three days prior to the time of parturition,—always assuring ourselves that they produce the desired effects,—attending to diet and inducing the secretion of milk in the udder by hand-rubbing and drawing off the fluid for some time before calving, thus setting up a drain upon the system; all these are aids in keeping the blood in its proper course and channels, and obviate the tendency to constipation invariably attendant on parturition, while immediately following the act we have a very convenient method of introducing medicine into the system, which, if any danger be apprehended, is desirable to be taken advantage of; I refer to the fact, that at this time she will drink almost any fluid, which, when given, as is almost always done, had



better have a moderate dose of the sulphate of magnesia dissolved therein. Bleeding has also been highly recommended as a preventive; only advisable, however, immediately before parturition, and in those cases where the more appropriate remedies have not been applied, or, when applied, have been found wanting. It may also be had recourse to after parturition under similar circumstances, always being careful to guard against exciting causes, such as indigestion, cold, or too much food of any kind. Granting, moreover, the fact, that a cow once having had an attack of parturient apoplexy is almost certain to be again affected at the next or other subsequent calving, it is our duty, therefore, as practitioners, to inform the owner, on recovery of his animal, of the evils attending the case, together with the preventive treatment I have indicated, in which, if carefully employed, I can place, from actual observation, the greatest confidence. Yet in no instance should we *strongly* advise the animal either to be kept or fed for the market, unless these preventive measures be applied judiciously, which with some may not be the case; for should we have given our advice *strongly*, to either of these ways, in the former we not unfrequently incur the censure of the owner, should he lose his cow at a subsequent parturition; in the latter, and especially if the animal was a profitable one, he may be found to grumble for having fed her.

In all such matters then, let us consider well before we decide or give an advice,—the surest way to keep ourselves free from any severe or painful reproaches.

#### PUERPERAL FEVER PROPER, OR METRO-PERITONITIS.

This other form of puerperal fever, which I have already indicated, and especially designated by the term puerperal fever proper, or metro-peritonitis, at once indicates to what organs we may look for the manifestation of the disease, the mucous and serous membranes of the abdomen, womb, and bowels. The inflammatory action is not that of ordinary metritis or peritonitis; these run ordinary and ascertained courses, but this does not; it may therefore be defined to be a specific or malignant erysipelatous inflammation of the mucous and serous contents of the abdomen attendant on parturition.

Like parturient apoplexy, the period of its occurrence may be said to be confined to the first week following parturition; it may, like it, occur early or late, *i.e.*, during the first twelve hours, or not until the third day; and it may be remarked as an unfailing concomitant, that where either of these forms occur early, the chances of recovery are much less than where the period of attack is more removed. Unlike the apoplectic form, the symptoms are somewhat gradually developed, the cow is observed to refuse her food, or views it in a careless manner, the secretion of milk is somewhat impaired or completely arrested. She is restless and feverish, with mouth and horns hot, extremities alternately hot and cold, pulse hard and



frequent, the visible mucous membranes injected, with a dry skin and diminished excretions. Abdominal pain will very shortly evidence itself as the characteristic feature all through the disease. At the outset this is shown by the cow while standing shifting from one hind leg to the other, drawing them under her, and occasionally striking with them at her belly. Gradually she becomes more restless and uneasy, will lie down first on one side then upon the other, repeatedly rising and lying down, vainly seeking a position that would afford relief. Sometimes she remains upon her knees for a little, which seems to give temporary cessation of pain, owing probably to the bowels being thrown forwards and pressing less upon the womb. While lying, she pushes her legs out from the body and as quickly draws them towards her again; the head is turned incessantly from one side to the other, or persistently poked into one flank; the breathing accelerated. All this time there is, however, no coma or insensibility evinced, rather the very opposite—the animal's sensibility and consciousness seem augmented. If not relieved, these symptoms soon become aggravated, or rather lost in others,—the pulse becomes small and weak, rising to 80 or 90 per minute, and loses its firmness. The respirations, formerly not much affected, now become faster, and accompanied with a distinct moan; there is marked increase of the abdominal pain, and tenderness of the udder; she is no longer capable of the repeated rising and lying down, the paunch frequently becomes distended, and the whole body is convulsed with pain; she strains occasionally, and the legs are moved rapidly backwards and forwards; she may be still able to roll from side to side. After a time the head is no longer laid quietly back to the flank, but wildly tossed in every direction. The brain has now become involved from the extensive derangement of the uterine and digestive organs. This is marked by the want of consciousness, where at first it was as markedly present. During all this period the bowels are torpid.

This state of intense excitement will generally be found to give place to a profound stupor a short while previous to death.

*Post-mortem.*—The appearances after death plainly show us, what the symptoms during life indicated, that the affection is especially one of the abdominal organs. We have extensive inflammation of the uterus, particularly evident in its large veins or sinuses; the lining membrane much thickened, dark coloured, and covered with unhealthy granular-looking lymph; the peritoneal covering of the abdomen, bowels, and uterus has sometimes considerable patches of inflammation, extending in some instances to the other coats of the intestines, and some way into the vagina; the bladder, from its contiguity, is similarly marked, while in those cases where phrenic symptoms have manifested themselves, the vessels of the brain and membranes exhibit distinct congestions—never, however, we think, that amount of organic change so characteristic of the apoplectic form.



In the application of treatment: we are here to be guided by the state of the pulse and condition of the bowels. We will rarely find the animal unconscious unless the disease is far advanced. Should the pulse be possessed of any considerable volume, and not over 80 per minute, blood had better be abstracted, not in any meagre quantity, but from a good orifice, and of such an amount as will sensibly affect the action of the heart, indicated through the pulse, by its becoming faster and softer. Here, I may remark, that scarcely will we find such evident beneficial results from venesection as in the other form. This part of the treatment, however, is certainly not at all advisable in those cases where the disease may have existed for some time, and with the pulse small and weak. The administration of purgative agents, nevertheless, is indicated in all stages, but is, of course, of most avail in the earliest; and those seem most beneficial which produce their effects with the least amount of irritation. Give one pound of linseed or castor oil in combination with twenty to thirty minims of croton oil, or two drachms of calomel, given amongst gruel sweetened with treacle, or beat up into an emulsion with eggs, is a very good formula. This may be repeated, if thought necessary, after the lapse of a sufficient period; in the interval give linseed tea sweetened with treacle, having in addition, two or three ounces of sweet spirits of nitre. It may also be advisable, where the pain is severe and continuous, to add tincture of opium. The application of counter-irritants to the abdomen and spine, especially to the former, must be employed early and persevered in assiduously. This is conveniently accomplished by hot water, through the medium of woollen rugs. These are first immersed in the water and then applied round the animal, or laid over the bowels. There is no necessity for removing them often if they will remain, as the water required is better poured over them; and between each such watering a dry cloth should be thrown over all, so as to retain the moisture and warmth, or these may be kept applied for two or three hours, and, on removal, let the parts be thoroughly rubbed dry, and a mustard cataplasm or cantharidine blister take the place of the water. Of course the injunctions given under the other form, as to attending to the animal's comfort, aiding the action of the medicine by emollient enemata, &c., are alike necessary here.

Having thus briefly considered these two forms of puerperal fever, it may probably be as well to pass in review those more marked features in which they differ; for that they are decidedly distinct, no one who has ever considered, however lightly, their pathology or symptomatology, can for a moment doubt. They differ as to the subjects they respectively affect. Those predisposed to the first form (the apoplectic) are animals of a plethoric habit, in the prime of life, after they have borne three or four calves, generally following an easy parturition; not attendant on abortion, retention of the placenta, or uterine hæmorrhage, but prevalent amongst animals that



have been the subjects of good careful keeping, and remarkable for their milking capabilities.

The metro-peritoneal form is not essentially connected with plethora, or peculiarly a disease of mature life, as it affects indiscriminately young as well as aged cows; indeed the former are more liable than the latter. It may follow a first as frequently as a fourth or fifth parturition; is more frequently a sequel of difficult than easy labour, the mechanical force being a direct excitant cause. It may follow abortion or retention of the placenta, and does occur in animals having uterine hæmorrhage; is rather prevalent amongst those cows which have been sparingly fed and afterwards more liberally supplied with nutriment; is not partial in its selection of good over bad milkers, although it occurs more frequently in the latter; is often induced by over-fatigue in driving prior to parturition; while either extreme of temperature seems liable to produce it.

They are totally distinct, as has been pointed out, in the organs involved, and consequently the symptoms evinced. The apoplectic form, being confined to the brain and larger nervous centres, is generally rapid in its course, marked by early and rapidly increasing stupor, exhibits no abdominal pain, no tenderness of the belly or udder on applying pressure.

Puerperal metro-peritonitis, again, is essentially a disease of abdominal organs, the peritoneum, womb, and bowels; requires longer time for its development; is not characterised by coma, or any want of common or special sensation, but the reverse; exhibits, in a high degree, abdominal pain, restlessness, shifting of the limbs, and decided tenderness over the region of the bowels and udder.

In the adoption of measures calculated to avert this latter form, much that has been indicated under the former is also applicable here. We have not as a general rule, however, a state of plethora to contend with; the causes which are ascertained to operate as predisposing or exciting must be sedulously guarded against. All sudden or decided changes of the dieting must be avoided, not only before but even more so immediately following parturition, as tending to upset the nicely balanced equilibrium of the system,—so extremely vascular and sensitive are the organs concerned in parturition, and very favourable for the production of disease under the slightest exciting cause. For a like reason, much caution is needed in driving pregnant animals from place to place, or allowing them to be unduly affected by either extreme of temperature, lest by fatigue or exposure we produce alike unfavourable results. “All our endeavours must be directed, as the period of parturition approaches, to keep the animal in as healthy and natural a condition as possible—avoiding all undue excitement or exertion, overfeeding, or indigestion, and assure ourselves that the bowels are kept in a soluble condition, and afford shelter from extreme heat or cold.” If she has been making progress in condition for some time previous, it is advisable to exhibit some laxative medicines at due intervals,



giving special attention to the state of the udder, and avoiding that common practice amongst cow-owners, when the animals are to be exposed for sale, of allowing them to go unmilked immediately before or for some time after parturition, for the purpose of procuring a large distended udder—what, in dealers' language is called a great "show of milk and having plenty of leather." This practice, therefore, cannot be too strongly condemned, as we can easily understand from what has been already said with regard to similar causes. Let the glands, instead of ever becoming distended, be frequently emptied, hand-rubbed and drawn at short and regular periods, for some days, or even a week before and after "*Status parturiendi*."

There are two points, gentlemen, to which I would desire to draw your attention before leaving this affection, and they are these:—*First*, That the sequel of this Puerperal Metro-peritonitis is nearly as much to be dreaded as the disease itself—as not unfrequently, when our hopes of recovery are at the highest, the symptoms of abdominal dropsy manifest themselves; *Secondly*, That from all I have learned, from observation and otherwise, I see nothing to induce the belief that this disease, in any of its developments, is infectious or contagious—being in this dissimilar from the alike named affection in the human female; the same, however, cannot be said for this, as exhibited amongst sheep-stock.

With regard to that other or complicated form in which this malady manifests itself, I have little additional to remark, as, strictly investigated, it can hardly be considered to rank as a distinct form, but may more properly be regarded as a not unfrequently occurring stage of the metro-peritoneal. Never do we find the purely apoplectic evidencing distinct abdominal symptoms. However, in all those instances of a complicated nature, we have always remarked that the abdominal organs are first involved, indicated by a train of symptoms peculiar to themselves. These, however, do not remain long distinct, but become associated with others, clearly indicative of the brain and nervous centres participating in the disease. In all these cases the issues are even more doubtful than in the majority of those forms of the uncomplicated affection; this we may understand when considering that we have here more extensive involvement of organs essential to life.

I am not aware that there are any appreciable causes to be associated with the special occurrence of this form; and in all such matters due weight must ever be given, not merely to adventitious external agencies, but also to animal idiosyncrasy, thereby giving to common or particular maladies peculiar and erratic courses.

In adopting curative means, we must, in addition to their early employment, be entirely guided by the nature and development of symptoms, to detail which were needless. Having gone pretty fully



into these in what we have already noticed, treatment must be mainly of an expectant nature.

Thus, gentlemen, so far as I have gone, although deficient on many points, yet I have given you, as far as I am able, what I consider a faithful *resumé* of parturient or puerperal fever in more than one of its phases. That I am wrong will require something more than assertion to convince me, while that I am entirely and unexceptionally correct, I would not presume to press on you to believe,—ever remembering, that in no scientific pursuit more than in pathological inquiry are we ever reminded of the truth of the adage "*Humanum est errare*;" and that he is a wiser man who, guided by the more correct data of to-day, has courage enough to change or forego the opinion of yesterday.

*Case of Pulsatory Action in an Abscess on a Cow's Sternum.* By  
W. A. CARTWRIGHT, M.R.C.V.S., Whitchurch, Salop.

ON Friday, the 27th November 1863, I was desired to look at a cow, five years old, the property of Mr Shelwell of this town, that had a tumour on the left side of the sternum; consequently, I went to the field to examine it, when I found that the tumour lay alongside the sternum, on the left side, and was the size of one's head, but a little elongated, and extended from nearly the front of the sternum to behind the inner side of the elbow-joint. The front part of the tumour was very soft, and was covered by nothing more than the skin, but about the middle of the tumour the sac was harder and of greater thickness. At the back part of the tumour there was a prominence the size of a duck egg, which projected downwards, and was distinctly prominent from the other part. This tumour was soft like the anterior part, and covered only by the skin. It being market day, I did not examine it particularly, but concluded it was nothing more than an abscess, and told the owner I must open it. The next day I went for the purpose of doing so, but, on more carefully examining it, I found, on pressing the soft part, and where I intended opening, that there was a strong pulsatory beat to be felt; and, on pressing the small posterior tumour, I found that there was a similar strong pulsatory action in that also. On ascertaining this I declined opening it—fearing it was some peculiar diffused aneurismal sac, though, at the same time, I thought it possible that this pulsatory action might be caused by some large artery beating and pressing upon the supposed abscess. The next day I mentioned the circumstance to Dr Gwynne of our town, who kindly expressed a desire to see it, and give me his opinion on the *rather* mysterious case; accordingly, the next day we went and examined it again, when he also considered it a rare and peculiar case, and believed it to be indicative of aneurism, and expressed an opinion that it would be imprudent to open it with a lancet, but suggested



that I should use an exploring needle, which I promised to do ; but the owner's wife declined our doing anything at it at present, fearing it might take the cow off her milk, as she was then giving fourteen quarts of milk a-day, and had calved only about six or eight weeks ago, and seemed in good health, and fed well, except making a roaring noise in her breathing, the particulars of which I will now relate. On the 22d of August last, I was called in to attend her, she having an apparently bad cold and some difficulty in breathing, and made a slight roaring noise, which I attributed to some thickening about the larynx or nostrils. I blistered the throat and gave her some medicine, and her general health was soon restored, but still leaving a noise in her breathing ; from then to the present time I did not see her, and, as I said before, she calved some six or eight weeks ago, and had fed an excellent calf. I was now told that an enlargement was noticed on her sternum towards the latter end of last summer, and which had gradually enlarged to its present size. Nothing was ever done to it, and it has never affected her health or milking. I may also observe that there is not the least œdema about the parts, nor is there any apparent tenderness in it, and it seems nothing more than a common abscess. The roaring noise has continued up to the present time, and the owner fancies this tumour has something to do with it, by pressing on the windpipe.

*5th Dec.*—This day I got permission to open it, and I accordingly called on the doctor, who lent me an exploring needle, and accompanied me to use it. The tumour, we thought, was, if anything, a little larger, but there was still the same throbbing pulsatory action going on in each part as before. Having secured the cow by the nose, I plunged the needle into the upper and front part of the tumour, and on withdrawing it the tumour was found to contain only pus. I then sent a lancet into it, and afterwards enlarged the opening with a knife, and drew therefrom upwards of three quarts of rank pus, of the colour and consistence of cream. Afterwards, I passed a seton (a foot long) from the front opening through the posterior part of the abscess. On introducing my finger into the abscess, I could pass it upwards into a cavity leading towards the parts where we feel the pulse in the axillæ, but, of course, I could not pass it much distance. To foment the parts three times a-day.

*6th.*—The tumour is sorer and harder, and a little more enlarged. To go on with the fomentations. Feeds and milks well. Put a plug of tow into the anterior opening.

*7th.*—Pulled the plug out, and there issued a teacupful of pus and serum. I fancy the tumour is less and softer. Insert another plug, and go on with fomenting. From last date to the 19th inst., it gradually subsided, and will soon be all right again. After opening the abscess I never was able to feel any pulsatory action going on in the parts.

Many may say that this case is nothing more than a common



abscess, and not worth recording ; but to me, I must confess, the pulsatory beat was anything but common, especially as the abscess had been forming so long a time.

---

*Abscess in the Walls of the Heart.* By W. HUNTING, South Hetton Collieries, Fence Houses, Durham.

*To the Editor of the Edinburgh Veterinary Review.*

SIR,—As cases of abscess occurring in the walls of the heart are of extreme rarity, and as the pages of our veterinary periodicals contain few examples of the disease, I have ventured to bring before your readers a short account of a case in which this lesion was found to exist. I may preface my remarks by stating that the only analogous case which I find recorded is one in Leblanc's "Tables of Diseases of the Heart."

The subject of the present communication was a brown gelding, 19 years of age, belonging to the South Hetton Coal Company, on whose farms it was working at the time of its death. I regret that the history of the case, previous to its fatal termination, is almost unknown to me, as I had never seen the case until I was called to make a *post-mortem* examination. The facts which I have been able to collect are the following :—The horse had worked for years in the pits before being employed on the farm, and, for the last five years, the period during which he had been under our supervision, he had never been known to be off work. The very day before his death he did his work well, and appeared in good health.

In consequence of having numerous engagements, the horse remained on the field, where it died, for a considerable time before I could make a *post-mortem* examination. Decomposition had somewhat far advanced at the time, so that I cannot say with certainty much about the condition of any of the viscera besides the heart. With the exception of this organ the rest appeared quite healthy.

The heart I found hard and swollen on one side, so I took it home for the purpose of opening it in the presence of my father. The swelling, which was of a dirty straw colour on its external surface, was situated on the wall of the left ventricle. On cutting through it there escaped a mass of partly fluid and partly solid pus. This solid pus had the appearance of crumbling cheese. If, sir, there are any further particulars which you would wish to know about the case, I should be most happy to supply you with all the information in my power, and I may add, that I should be glad to hear your opinion about it.—I remain, &c.,

W. HUNTING.



*Remarks, by the EDITOR on Mr HUNTING'S Communication.*

The case recorded by Mr Hunting is one of extreme interest. Idiopathic inflammation of the muscular substance of the heart is an affection which has been but very rarely observed and described. As Dr Walshe has stated,—“The disease has yet to be observed before its description can be written.” That partial carditis going on to suppuration, and even gangrene, does occasionally occur, the record of a few cases has rendered certain, and we think it worth the while, as tending to throw some light on this subject, to notice shortly the literature of this important subject.

It is in works devoted to the discussion of the diseases of the heart of man that we find the few cases which we shall notice, but we hesitate not to quote them, as the pathology of the affection in man and the lower animals will most probably be identical.

Dr Graves, in his *Clinical Lectures*, has given the history of a man suffering from valvular disease of the heart, who, after being subject for some time to excruciating pain in the cardiac region, died suddenly. An abscess was found in the substance of the heart, containing two ounces of pus.

Dr Latham (*Pathological Essays on some Diseases of the Heart*: being the substance of Lectures delivered before the College of Physicians; “*London Medical Gazette*,” vol. iii. p. 119) has described a case in which, after death, an abscess was found in the substance of the left ventricle. The patient had suffered for some time from symptoms referable to the heart.

Dr Chambers, of Colchester, described, in 1844, a case of suppuration of the muscular substance of the heart, occurring in a boy of fourteen.

Mr Hatton, of Leicester, records the instance of a man who, after being attacked suddenly whilst at work, with coma, cyanosis, and feebleness, died on the third day. After death a large abscess was found in the substance of the left ventricle.

Dr Craigie, in his “*Pathological Anatomy*,” mentions a case which he observed, in which abscess of the auricular walls was associated with disease of the aortic valves. In the Museum of the University of Edinburgh there is the preparation of a heart, in the septum of which a large abscess was found. The patient in this case died suddenly.

Poterius, Bonivius, Nicolaus, Massa, Fantoni, and Laennec, are mentioned by Dr Craigie, in his formerly quoted work, as having described cases of abscess of the heart.

The cases of idiopathic abscess of the heart must of course be carefully distinguished from a much more numerous class of cases, in which purulent deposits occur in the muscular substance of the heart. In pyæmia such deposits are of tolerably frequent occurrence; the fact of similar abscesses being found in other viscera, and the general history of the cases, always clearly enough distin-



guishes them from the more rarely occurring cases of abscess of the heart. The history of Mr Hunting's case clearly proves that his was a case of real phlegmonous abscess, occurring in the muscular substance of the heart, and not of purulent deposit, the result of purulent infection.

We may conclude by saying that the cases which have yet been recorded of abscess of the heart, throw no light on its etiology, pathology, or symptomatology. The affection has appeared most frequently as a complication of previously existing cardiac disease, and in a majority of the cases appears to have caused sudden death; in a majority it was accompanied likewise by pains in the region of the heart. That in some of the cases which have occurred, embolism (or plugging) of one of the smaller branches of the coronary arteries may have been the starting point of the affection, the researches of Virchow would lead us to suppose.

EDITOR OF THE EDIN. VET. REVIEW.

---

*Polypus of the Right Bronchus from a Mare.* By J. M.  
PARKER, M.R.C.V.S.

DEAR SIR,—The tumour sent per train was taken by me from the respiratory organs of an aged chestnut mare, and I now send the particulars of the case :—

The mare was bought nearly five months ago by a horse-dealer residing at Oldbury, a village in the Colliery district, about five miles from here. When brought home, the mare was turned out in a piece of meadow land near the owner's house, and nothing was then perceived which would lead to the idea that there was any disease. In the course of the next day her respiration was observed to be hurried and laborious, but her appetite being good no notice was taken beyond the application of a stimulant to the throat. The animal getting worse during the next few days, was attended by a succession of farriers, that class abounding in the coal country. This went on for more than three months, when she was seen by a veterinary surgeon, who attributed the illness to an attack of influenza; and giving directions for the animal's comfort, he advised a continuance of the treatment the mare was then under, namely, repetition of stimulants, and care in diet. She afterwards became much worse, and on the third of this month I saw her for the first time. I found her standing in a shed, coughing violently, a deal of frothy mucus was hanging about her lips and nostrils, her pulse was 80 and feeble, mucous membranes claret-coloured, her respiration was violent and laboured, resembling the last stage of emphysema. Her extremities were warm, and her appetite very good. There was no fetor from her nostrils. I was shown a quantity of blood and pus, which was said to have been coughed through the mare's mouth after being drenched with some linseed





BRONCHIAL POLYPUS.







oil. As I was only called in to give an opinion as to the curability of the disease, I did not advise any treatment, but told her owner that I could give no hope of her recovery. On the 8th inst., I was again sent for, and found the mare weaker, her appetite not so good, and, although the breathing did not seem so painful, she was evidently worse. The next morning I called again, and having more time to watch the case, I stood with the animal for nearly an hour. When I first entered the stable she was coughing, and her respiration was violent in the extreme. Suddenly it became more tranquil, and continued so for ten minutes. I then offered her some clover, which she ate with avidity, but as soon she had swallowed a pellet, she coughed, and that instant the violent respiration recommenced. I could not detect any soreness of the throat, and the thought struck me that there might be a cause for the coughing fit lower down the trachea. There was nothing external to be observed. These changes in the breathing were frequent. The owner of the mare in a day or two afterwards was advised to turn her out to grass, and on the evening of the 21st inst. she died. I can glean no history of her while out, as she seemed to me to be left to take her chance. The portion of lungs and trachea now sent was removed the following morning. There were abscesses pointing under the pleura pulmonalis in a dozen places, and the whole substance of the lungs was studded with abscesses containing healthy-looking pus. Although the mare was thin, there was a considerable amount of fat in her muscular structure, and there were clots in the principal arteries. I have sent the specimen, hoping that you will kindly examine it, and I have no doubt that the mobility which the tumour acquired from its pedicle being so long and loose, was the cause of the various changes in the respiration.—I am, dear Sir, yours truly,

J. M. PARKER.

BIRMINGHAM, *Sept.* 24, 1863.

*Remarks.*—The specimen forwarded by Mr Parker is a polypus growing from the mucous membrane covering the lower wall of the right bronchus, and about an inch below the bifurcation of the trachea. The tumour is an irregular ovoid, most bulky at its anterior extremity, and somewhat smaller towards its lower end. It is compressed from above downwards, and presents several irregularities on its surface. After having been withered up to some extent by lying in spirit, it still measures, in its longest circumference and diameter respectively,  $8\frac{1}{4}$  inches and 3 inches. Its shortest circumference at the pedicle is  $4\frac{1}{2}$  inches; diameter a little over an inch. By its size it would entirely fill the right bronchus, or nearly so, and would allow only the smallest quantity of air to enter the corresponding lung. The pedicle of the tumour is  $1\frac{1}{2}$  inch long and about 9 lines in circumference. The attachments of the mass are thus so loose that it can easily be made to ascend the



bronchus until it is lodged in the lower end of the trachea, with an extremity projecting into the left bronchus. In this way the access of air into the lungs would be almost entirely put a stop to ; and in this manner originated, in all probability, those violent paroxysms of coughing which characterised the malady.

The pedicle, notwithstanding its laxity, seems to contain a considerable amount of fibrous tissue, besides vascular twigs and the enveloping mucous membrane. It gains an attachment not to the mucous membrane alone, but its fibrous portion passes outward in the interval between two rings, and becomes connected with the external fibro-elastic covering of the latter. This fibrous covering of the rings is itself considerably thickened at this point.

The polypus is firm and resistant to the touch, and on section presents a dense fibrous structure, which had evidently been possessed of little vascularity. On placing a thin slice under the microscope, it appeared composed of delicate interlacing fibres, the interstices of which were filled up by a finely granular material. The fibres in great part swelled up and became transparent on the addition of acetic acid. The tumour was covered by a delicate fibrous envelope.

The term polypus has been given to certain excrescences, vesicular, gelatinous, fibrous, or malignant, which grow from mucous membranes. The term, originally given from an erroneous supposition that the tumour was possessed of many roots or feet, has been retained for the sake of convenience. The vesicular and gelatinous forms are rarely if ever met with in the horse, while the so-called malignant polypus, even as occurring in the human subject, is only a scirrhus, or hard variety of cancer, localised in a mucous membrane.

The fibrous polypus is not uncommon in the horse, and may occur on any of the mucous membranes. It is met with in the uterus or vagina of the mare ; when, if situated near the neck of the former or in the latter, and if of considerable bulk, it will interfere with the process of parturition, and removal will be necessary before the foetus can be expelled (Jeanrey, *Receuil de Médecine Veterinaire* ; Rainard on Parturition). It is, however, much more common in the air passages, and is then mostly situated in the nasal chambers. Instances of nasal polypi are mentioned by Youatt, Vatel, Gohier, Chabert, Rigot, and others. Less commonly, though by no means very rarely, are they found occupying the fauces or pharynx. In the former case, the one nostril is more or less obstructed, and respiration may be carried on by one only ; in the latter, much more immediate danger is to be looked for. The tumour, hanging, as it usually does after a time, by a loose pedicle, will occasionally fall into the upper orifice of the larynx, and by irritating its highly sensitive mucous membrane, lead to the most violent paroxysms of coughing. It moreover prevents the entrance of air, and places the animal in imminent danger of suffocation.

It is an extremely rare occurrence to meet with a polypus in the



trachea, or, as in the present instance, in a bronchus. The case is of the greater importance, as showing that no mucous membrane obtains an immunity from such tumours, but that they are to be expected wherever mucous tissue is met with throughout the body. It is further important, as exhibiting a probable cause of chronic and paroxysmal coughing, when no reason for such is to be found in the anterior part of the respiratory apparatus.

When, as in the present instance, the tumour is lodged in one bronchus, the air is allowed free access to one of the lungs, and the natural dull sensibility of the bronchial mucous membrane is not often excited, so as to induce violent coughing. When, however, by a forcible expiration, the polypus is passed up in great part into the lower end of the trachea, or lodged across the commencement of the two bronchi, the entrance of air into both lungs is largely interfered with, and the animal placed in a condition somewhat analogous to that resulting from cutting both vagi, or recurrent nerves.

ED. OF THE EDIN. VET. REVIEW.

---

*Physiology of the Pneumogastric Nerve in the Horse. Being an Extract from an Essay read before the Edinburgh Veterinary Medical Association, December 11th, 1863. By JAMES LAW.*

THE importance of the structures to which the vagus is distributed, and the vital offices such structures fulfil in connection with respiration, deglutition, digestion, and vomition, as well as the serious derangements of these organs attendant on lesions of its structure, have led to numerous and close observations on the part of physiologists into the functions of this nerve. The mutual dependence, however, of the organs to which the nerve is supplied for the due exercise of their functions, and the numerous connections established between the divisions of this nerve and of those adjacent, have rendered the investigation of its functions a matter of no small difficulty.

The question has been often asked, *Do the roots of the pneumogastric nerve contain motor filaments?* The proximity at their origin of the anterior roots of the spinal accessory and those of the vagus nerve, and the resemblance of these two nerves as they pass through the lacerated foramen to the anterior and posterior roots of a spinal nerve,—the vagus representing the sensory root,—the spinal accessory the motor,—and the jugular enlargement the intervertebral ganglion,—have led some anatomists (Arnold, Scarpa, Benza) to the conclusion that their functions in like manner corresponded. Eminent physiologists are not wanting who seek to substantiate this opinion by their experiments; but on the other hand, the experimental researches of Müller, Dr John Reid,<sup>1</sup> Volkmann,<sup>2</sup> Stilling,<sup>3</sup> and Bernard,<sup>4</sup> con-

---

<sup>1</sup> Cyc. of Anat. and Phys.

<sup>2</sup> Müller's Archives, 1840, p. 443.

<sup>3</sup> Bischoff's Benicht-über die Fortschritte der Physiologie, 1842.

<sup>4</sup> Archives Générales de Med.



clusively establish, that even at its origin the vagus contains motor filaments. The recent experiments of Chauveau upon solipedes leave nothing more to be desired, so far as regards the subject of the present essay.

*1st Experiment.*—A healthy young mule was laid on its right side, and rapidly killed by opening several large arteries. The chest and abdomen were at once opened, the roof of the cranium removed, and the roots of the vagi exposed by excision of the cerebellum. (a) Electrical excitation of the roots of the right pneumogastric produced instantaneously energetic contractions of the anterior part of the œsophagus. The posterior part of the gullet and the stomach were likewise subjected to contractions of an active character, but these were not so immediately developed. (b) Excitement of the left pneumogastric led to similar effects, but the contractions of the lower part of the gullet and stomach were less marked. (c) Excitement of the substance of the medulla around the origin of the roots of the vagus had no effect, whether the stimulation were applied to the surface or in the centre of the medullary nervous matter.

*2d Exp.*—An old and debilitated horse was destroyed by bleeding from both femoral arteries. The pharynx and cervical portion of the gullet were laid bare, and the state of the thoracic part of the latter ascertained by introducing the hand through the diaphragm into the chest. The roots of the pneumogastric were laid bare as before. (a) Pinching of the anterior bundle led to contractions in the pharynx and œsophagus, but especially powerful in the latter. The pharyngeal contraction seemed confined to the posterior constrictor, which pulled the pharynx backward and to one side. (b) Pinching of the median bundle induces energetic pharyngeal contractions, which lead to no displacement in an upward or downward direction, and likewise contractions in the whole length of the œsophagus, but more feebly than before. (c) Pinching of the posterior bundle of roots caused active contraction in the pharynx, and very feeble movement in the gullet. The contractions in the pharynx seemed chiefly due to the anterior constrictor as the organ was pulled upward and forward.

These effects were induced in an exactly similar way when the anterior, median, and posterior bundles were stimulated by means of electricity. It possessed this advantage, however, that the contractions were continued so long as the wires were kept in contact with the roots of the nerves, and were not simply momentary as when they were pinched. This permitted a more lengthened and satisfactory study of the character of the contractions which differed in the anterior and posterior regions of the œsophagus. The tracheal part of the gullet, and extending as far backward as the base of the heart, became rigid at once on the application of the stimulus, and continued so until its suspension. In that part of the gullet between the heart and the stomach the contractions occurred soon, though not instantaneously, after the application of the stimulus,



and took the form of a series of very energetic vermicular movements passing rapidly towards the cardia.

*3d Exp.*—In an old horse, the stomach, which was nearly empty, and the whole length of the œsophagus, were rapidly laid bare. The roof of the cranium was removed, and the roots of the right pneumogastric subjected to electrical stimulation. The stimulation of the anterior, median, and posterior bundles gave rise to phenomena exactly like those observed in the last experiment. The exposure of the stomach in this case showed that this viscus was likewise thrown into vermicular movements which immediately followed those of the gullet.<sup>1</sup>

These experiments clearly prove not only that the roots of the pneumogastric nerve contain motor filaments at their point of emergence from the medulla oblongata, but that the majority of these filaments cross each other in their course, the anterior going in greater part to the œsophagus and stomach, the posterior to the anterior part of the pharynx, and the median to the intermediate parts of these structures.

*Filament communicating with the Spinal Accessory.*—This twig is composed of the anterior cranial roots of the spinal accessory, and the function of its component fibres is to preside over the voice. Bischoff's and Bernard's experiments on cats and rabbits are conclusive on this point, so far as these creatures are concerned, whilst anatomical similarity would reasonably lead to the inference that their function is quite the same in the horse. The experiments of Chauveau establish this point physiologically. Bernard<sup>2</sup> cut the anastomosing twig of the spinal accessory in cats and rabbits, and kept the subjects for a number of days, months, and in one case for several years, with the effect of rendering the animal completely and permanently aphonic, without in any way altering the normal movements of digestion, respiration, or circulation. After the operation, however, the subjects cannot eat or drink with their accustomed rapidity, or, if they do, they are liable to pass portions of food into the trachea from their utter inability to close the glottis. Division of the anastomosing branch on one side only rendered the animal hoarse, but did not lead to a complete loss of voice. When the roots of the spinal accessory were cut from below upward, it was only when those arising in front of the first cervical nerve had been divided that any effect on the voice was observable, and not until the most anterior of its roots had been divided was complete aphonia produced.

Chauveau's experiments were performed on the dead horse, but are nevertheless highly satisfactory.

*4th Experiment, made on the Left Nerve of an old entire Horse.*—  
(a) Pinching of the spinal accessory where it enters the cranium led

<sup>1</sup> Brown-Séquard's *Journal du Physiologie*, No. xviii. 1862.

<sup>2</sup> *Leçons sur le Phys. et Path. du System Nerveux*, tome ii. p. 292.



to powerful contractions of the trapezius and levator humeri, with some movement in the larynx, but none in the pharynx, œsophagus, or stomach. (b) Pinching the superior cranial roots produced narrowing of the glottis, tension of the left vocal cord, and raising of the mass of the larynx by the contraction of the fore part of the anterior pharyngeal constrictor, but no movement in the cervical muscles, stomach, œsophagus, or posterior part of the pharynx. (c) Pinching of the roots of the vagus, caused energetic contractions in the pharynx and gullet, but no movement whatever in the glottis or cervical muscles. On the same roots being excited by electricity, substantially the same results were produced. In addition, it was noticed that the partial contraction of the anterior pharyngeal constrictor, which resulted from stimulating the anterior roots of the spinal accessory, was not produced by exciting the nearest adjacent roots of the vagus. Further, the electrical stimulation of the latter caused slight gastric movements which did not occur in mechanical excitation.

*5th Exp.*—An old gelding was destroyed, and had larynx, pharynx, and cervical part of the œsophagus laid bare. (a) Seven minutes after death the anterior, median, and posterior roots of the pneumogastric are pinched, with precisely the same results as in previous experiments. (b) Pinching of the anterior roots of the right spinal accessory caused the larynx to be drawn upward and forward, by the contraction of the anterior bundle of the anterior constrictor, and movement of the arytenoid cartilage and closure of the glottis, as ascertained by the finger carried through an opening in the crico-thyroid membrane, and introduced into the larynx. (c) Pinching of the median cranial roots of the spinal accessory, led to laryngeal movements only. (d) Pinching of the posterior roots of the same, induced contractions in the levator humeri only.

The same results were obtained on electrical excitement. The larynx having been drawn into view through a hole in the hyothyroid membrane, it was observed that the crico-thyroid muscle did not contract with the other muscles of the larynx, when the roots of the spinal accessory were stimulated, but did so along with the lower constrictor and the œsophagus when the stimulus was applied upon the median roots of the pneumogastric.

These experiments, selected from a number of others, pointing equally in the same direction, unequivocally demonstrated,—1st, That the spinal and posterior cranial roots of the spinal accessory preside over the movements in the trapezius and levator humeri muscles, but have no influence on the larynx; 2d, That the anterior cranial roots of the spinal accessory preside over the movements of the intrinsic laryngeal muscles, with the single exception of the crico-thyroideus, which is acted on by the other median roots of the pneumogastric; 3d, That this stimulation leads to narrowing of the glottis, and tension of the vocal cords, as for the production of sound; 4th, That stimulation of the same roots leads to contractions of the anterior



bundle of the anterior constrictor ; 5th, That stimulation of the roots of the pneumogastric induces active contractions in all the pharyngeal muscles, but in none of the laryngeal muscles with the exception of the crico-thyroid, and, when its anterior fibres are touched, feebly in the crico-arytenoideus posticus.

The sum of the matter is simply this, that the spinal accessory, through its anastomosing branch, presides exclusively over phonation, while the vagus assists in controlling those movements of the larynx which are immediately connected with the respiratory process. That the motor filaments of the larynx are entirely derived from these two nerves may be safely inferred from the above experiments, and the fact that Chauveau observed no laryngeal movement from stimulation of the roots of the facial nerve, and the superior cervical ganglion, with both which the pneumogastric anastomoses.

*Branch to the Facial.*—The physiology of this branch is not well understood. Dr John Reid<sup>1</sup> infers that it is sensory, from the fact that it is partially distributed to the mucous membrane of the middle ear. Bernard cut this twig in rabbits, by dividing vertically the posterior wall of the tympanic cavity, and thus induced diminution or cessation of the rhythmic respiratory movements of the ala nasi on that side. Neither he nor Chauveau have succeeded, however, in giving rise to movements of the nares by stimulation of the roots of the vagus, so that it remains probable that the filaments of this twig are entirely centripetal, and that their action on the nares is of a reflex character.

*Pharyngeal and External Laryngeal Branches.*—The distribution of the pharyngeal nerve to the muscles of the pharynx and cervical part of the œsophagus, would lead to the inference that it is the motor nerve of those parts. This is confirmed by the result of experiments. Longet<sup>2</sup> observed very marked contractions in the pharynx on galvanising the pharyngeal branch of the vagus in the horse and dog. Dr John Reid<sup>3</sup> found, after cutting it in dogs, that the second act of deglutition could not be properly performed, the food being slowly forced through the pharynx into the gullet by the repeated efforts of the muscles of the tongue, and those attached to the hyoid bone. It was however reserved for Chauveau to demonstrate, that not only is this the motor nerve of the pharynx, but, in horse and sheep and dog alike, it is that of the cervical portion of the œsophagus also. This is established by a series of carefully conducted experiments,<sup>4</sup> of which, so far as the horse is concerned, I will endeavour to furnish a short account.

6th *Exp.*—An old horse was cast on his left side, and the œsophagus, throughout its entire length, with the pneumogastric nerve and its principal branches, exposed. The tracheal part of the gullet rested

<sup>1</sup> Cycl. of Anat. and Phys.

<sup>2</sup> Anatomie et Physiologie du System Nerveux, &c., 1842.

<sup>3</sup> Cycl. of Anat. and Phys.

<sup>4</sup> Journal de la Physiologie, April 1862.



immoveable, the post-cardiac part exhibited active vermicular movements when touched. (a) Galvanising of the vagus at its exit from the lacerated foramen, produced clonic spasms of the whole of the pharynx and tracheal portion of the gullet, and violent vermicular movements in the post-cardiac portion of the gullet. (b) Galvanising of the *pharyngeal nerve* gave the same results, with this exception, that the vermicular movements in the gullet were very feeble, and did not show themselves at once on the application of the stimulus. (c) Galvanising of the *superior laryngeal nerve* produced no effect whatever on the pharynx or œsophagus. (d) Galvanising of the *external laryngeal nerve* caused lively contractions in the crico-thyroideus and the inferior constrictor of the pharynx, contractions in the tracheal portion of the œsophagus, but much less powerful than those resulting from exciting the pharyngean nerve; the terminal part of the gullet showed at rare intervals slight vermicular contractions. (e) Galvanising of the vagus in the middle of the neck led to active vermicular movements in the post-cardiac part of the œsophagus, but no movement in the tracheal portion or pharynx. (f) Galvanising of the recurrent close to its origin, produces spasms in the laryngeal muscles, but no effect on the œsophagus or the pharynx. (g) Galvanising of the pharyngean and external laryngeal nerves produces the same effects as before, but no vermicular movements of the post-cardiac part of the gullet.

*7th Exp.*—An entire horse, in good condition, was cast on the right side, destroyed, and the whole length of the œsophagus exposed. The terminal part contracted spontaneously, or under the pressure of the fingers, for some instants after exposure; the anterior portion remained flaccid. (a) The pharyngean and external laryngeal nerves were cut through close to their origin from the vagus, and on the divided ends being stimulated, there resulted contractions, strong or feeble, according to the particular nerve excited, of the tracheal part of the gullet; the post-cardiac portion likewise frequently executed vermicular movements. (b) The œsophagean branch of the pharyngeal was then exposed and cut through in the middle of the neck, and the contractions from stimulating the nerve extended no further than the point at which the trunk was divided. When, on the other hand, the lower portion of the divided nerve was stimulated, violent contractions instantly ensued from the point of section to the level of the heart, and feeble vermicular movements tardily developed from this to the cardiac end of the stomach. (c) The vagus was then isolated and cut through in the middle of the neck, and the end of the lower or detached portion stimulated, with the effect of inducing inactive vermicular contractions in the posterior part of the œsophagus, only commencing at one or two inches (7-8 centimetres) in front of the base of the heart. (d) Stimulation of the cords of the vagus behind the base of the heart, at whatever point of their course this might take place, led to vermicular movements in this portion of the œsophagus.



Nothing could more conclusively demonstrate that the pharyngeal nerve supplies with motor filaments not only the pharynx, but likewise the tracheal portion of the gullet; or that the external laryngeal nerve supplies motor innervation not only to the crico-thyroides and lower constrictor of the pharynx, but also in a minor degree to the whole of this anterior portion of the œsophagus. The impossibility of inducing contraction in the tracheal portion of the œsophagus by galvanisation of the vagus in the middle of the neck, or of the recurrent laryngeal, entirely excludes the idea of their supplying motor filaments to this part, inasmuch as that at the same time they still retained the power of causing contractions of the laryngeal muscles and the terminal portion of the gullet.

(*To be continued.*)

---

## REVIEW.

---

*Agricultural Education*, pp. 167. London: Longman, Green, Longman, Roberts, and Green.

THE small volume now lying on our table, which is entitled "*Agricultural Education*," contains the introductory lectures of the Professors of the Cirencester College on the various sciences relating to agriculture taught in that institution. At the present time it is to be regretted that farmers do not evince a better appreciation of the value of scientific knowledge, and though we have reason to congratulate ourselves that matters are improving, we still feel that south of the Tweed farmers are extremely slow to avail themselves of the opportunity of studying the sciences relating to agriculture. We hope that an extensive circulation of these introductory lectures will serve "to shake those prejudices which are so firmly fixed in the English agricultural mind." Though Scotland is a much smaller country than England, we can almost venture to say that a greater number of farmers' sons study the sciences relating to agriculture than in England. The existence of an institution like the Cirencester College, however, should have the effect of gradually removing the prejudice which exists against such knowledge. In these lectures, though the advantages of a thorough educational training are ably set forth, we also find that the necessity of practical knowledge is strongly enforced. In order to back up his arguments as to the necessity of acquiring practical skill in agriculture, Mr Morton relates the following amusing observation of the late Lord Ducie, who used to say, "A young man will never be a farmer unless he can enjoy to sit for two hours on a hurdle and look at a sheep."



We trust that Cirencester College may take a leading position in the improvement of agriculture, and that the reputation which it has hitherto enjoyed may be increased and extended. Among well educated farmers the services of the veterinarian will be well appreciated, and we even assert that the acquirement by the more intelligent farmers of an elementary knowledge of the veterinary art will do more to drive quacks and empirics from dabbling in veterinary practice than all the Acts of Parliament which can be levelled against them. Professor Murray, who lectures on Anatomy, Pathology, and Therapeutics, after describing the relations of these branches of veterinary science to agriculture, thus generalises the advantages of a knowledge of the veterinary art to farmers :—

“Not that we would have you gather from these remarks that it is our aim here to make the students veterinary surgeons, or even capable of prescribing for their sick animals. It is one of the sure evidences of a well-instructed and well-balanced mind to be cautious of acting in matters where it feels its ignorance, and to be reliant on the help of better informed men ; and therefore we should regard our system to have failed, if it did not produce in you a proper respect for the skill and services of well-qualified practitioners. It is the ignorant untutored mind which is rash and easily led into experiments ; the well-educated, conscious of its deficiencies, is cautious and reliant on the help of superiors.

“And therefore, with the exception of the few whose lot may be cast ‘far from the busy haunts of man,’ in the wilds of New Zealand or Australia, and on whose own skill and knowledge their flocks may be dependent for medical treatment, you will find that the chief value of the course of study in Veterinary Science will be what I have endeavoured to point out ; namely, an acquaintance with the frames, forms, and habits of our domestic animals ; a knowledge of the principles of health, and therefore of disease, which are only modifications of these ; a respect for the skill of the practitioner, and therefore an appreciation of the necessity of an early application for his help, and not, as is too often the case, a recourse to him when the disease is beyond treatment.

“I might extend these remarks to a much greater length, for I believe that Veterinary Science has a very direct bearing on the daily business of the agriculturist ; but I trust enough has been said to convince you that the study is not only interesting and well adapted for a place in an educational course, but one of which the knowledge will be remunerative to the agriculturist. Any study which, besides developing the faculties, furnishes a student with much practical knowledge in the profession he is to be engaged in in after life, has a prominent claim on his early attention and industry.”



# EDINBURGH VETERINARY REVIEW

AND

## Annals of Comparative Pathology.

---

### IRISH HORSES.

THE decline of so fertile a part of the United Kingdom as Ireland, which has supplied us with some of the best horses in Europe for all purposes, and especially for the remount of our cavalry, is a matter of serious moment. It is proved that the country is poor—that stock is diminishing in quantity, and labour badly recompensed. How, then, can we expect Irish horses to abound? The first requisite in improving the breed of animals is to invest capital, and no small amount of it. If money is wanting, enterprise languishes, and especially in these days of free intercourse with countries which can afford to pay handsomely to carry off the best kind of stock, which we need so much at home. At the half-yearly meeting of the Royal Agricultural Society of Ireland, held on the 17th ult., Captain Thornhill read a report, in which he said:—

“The attention of your Council was particularly called to the description of thoroughbred horses competing for the Croker challenge cup. The judges appointed to adjudicate thereon considered they were so very deficient in the qualities required by the conditions, that not one of them was fully qualified for the prize. It was, however, thought desirable to award it to an English horse named Claret, as coming nearer to what was required than any other of those exhibited. The question of the breeding of horses, and the deterioration that has taken place therein, consequent on the inferiority of thoroughbred sires in Ireland, had for a considerable time occupied the attention of many of your members. The subject was brought under the notice of your Council at Kilkenny by Sir John Power, Bart., one of the judges before alluded to, when the statement made by him appeared so intimately connected with the agricultural prosperity of the country, that the subject was postponed until the next meeting of your Council in Dublin. Sir John Power accordingly attended at a very large meeting on Thursday, the 24th of September, and brought forward the matter very fully, reading



several letters from noblemen and gentlemen, fully confirming his statement 'that the superior and useful class of horses which formerly abounded in Ireland was now nearly extinct.' Your Council, after full consideration of the matter, appointed a committee, consisting of the Earl of Bessborough, president of your Society; Lords Crofton and Dunlo; Sir John Power, Bart.; Sir Percy Nugent, Bart.; Mr H. J. M'Farlane, Major Borrowes, the Hon. King Harman, and Hon. Thomas Preston, with power to add to their numbers from parties not necessarily members of the Society; and it was resolved 'that the entire subject be referred to the committee, whose duty it will be to place themselves in communication with parties most likely to afford valuable information, and to report at a future period as to the best mode of providing a remedy for the evil complained of.'"

We shall be glad to learn what the influential committee appointed in Dublin proposes as a remedy, but we may in the meantime point out that the question is one which affects the wealth of the country. The Irish are fond of horses—though they often ill-use and injure them seriously when young, but they aim at obtaining stock as good as they can afford to buy and keep. If they can be well paid for keeping the best horses to breed from, they will be likely to make an effort in the right direction. Though bad horses are now very cheap, good animals never were dearer, but the good ones which realize large sums are too few to keep up an unflagging spirit in horse-breeding. We must raise the quality of the common sorts, and probably this could be brought about by Government advancing the price given for remounts. It is well known that it is not easy to get good horses for many of our regiments, and there is a serious loss incurred by the purchase of inferior ones. An interesting investigation might be made as to the price of horses in different countries, and as to the relative price paid by Government and the general horse-keeping public. We are inclined to believe that such an inquiry would lead to an advance in the price offered for horses for the supply both of our cavalry and artillery, and such a result would at once affect, and most beneficially so, the horse-breeding people of Ireland.

Another point is well worthy of notice. The improvers of the breeds of horses of the blood class have throughout all time been the wealthy. A few hints and historical facts might stimulate the landed proprietors of Ireland to keep first-rate stallions, and induce their tenants not to sell their finest mares.



## VETERINARY JURISPRUDENCE.

—o—

## DISEASED MEAT PROSECUTIONS.

*(From the Dundee Advertiser.)*

AT the Dundee Police Court on Saturday, 19th ult., before Bailie Yeaman (Bailie Scott being also on the bench), William Ogilvy, flesher, Overgate, again appeared on the charge of having diseased meat in his possession. Mr Paul appeared for the defence.

The BAILIE asked the prisoner if he still adhered to his plea of not guilty?

OGILVY.—I had nothing to do with the diseased meat whatsoever.

The evidence for the defence was then led, the following witnesses being called :—

Mr ROBERT KERR deponed,—I am a master flesher in Dundee. I have seen the two carcasses now lying in the courtyard, and which are said to have been seized in Ogilvy's yard. One of them is what I would consider to be a fair beast; it is not first or second class, but I would say it is third class; and with regard to disease, I don't think it has been affected by it. It may have been slightly, but I can't say that I see signs of it. I was shown the lungs of that beast, and they had no appearance of disease. With regard to the other beast, there was some disease there, and I would not give the same opinion of it as of the other. I could not say whether pneumonia, when in its first stage, would unfit a beast from being used as human food. The beast of which I spoke first should not have been condemned as diseased.

By Mr MACKAY.—I did not see any symptoms of disease about that beast. I did not say that I had seen any such symptoms. I said it might have been slightly diseased. There was nothing wrong about the lungs of that beast.

Mr MACKAY.—Do you know how this disease, which is peculiar to cattle, begins?

Witness.—No; I can tell nothing about it.

Mr MACKAY.—Is it the case that the first symptoms always appear in the lungs?

Witness.—Yes, I suppose so; at least, so far as I know.

Mr MACKAY.—Is that your opinion?

Witness.—Yes.

Mr MACKAY.—Did you never know that it begins in the blood first, and afterwards develops itself in the lungs?

Witness.—I don't know that. I may have heard of it, but I don't remember about it.

By the CLERK.—Do you know if, when a cow becomes diseased, she falls off from giving milk?

Witness.—There was a man speaking to me the other day about cows, who said that, after they had been eight days in the disease, they were still giving a little milk, though not so much as before.

Mr MACKAY.—I believe that is so, and they will give milk longer than that, and to the great detriment of the public; for, if a beast be diseased, the milk cannot but be contaminated.

Witness.—I don't know about that.

Mr MACKAY.—Do you mean to say that if the beast were diseased, the milk would not necessarily be contaminated?

Witness.—Well, I couldn't speak to that. Ogilvy, with two other men, called on me the day before yesterday, and said he had bought two beasts from Mrs Thompson, of the Blackness Road, which had both been seized. He said he bought them for sound cattle. He asked me to examine them.

Mr MACKAY.—Did he ask you to be as easy as you could with him?



Witness.—Well, I don't mind exactly, but perhaps he may have said something of the kind.

By the BAILIE.—Ogilvy did not tell me what he paid for the beasts.

Mr PAUL.—And it is your opinion that one of the beasts at least is not diseased?

Witness.—I am upon oath, Mr Paul, and I have stated what I believe to be the truth about the beasts.

WILLIAM RUTHVEN was then called as a witness, but did not appear.

ALEXANDER PRAIN deponed.—I have been a flesher for three and a half years. I have examined one of the beasts now lying in the courtyard, and in my opinion it is fit for human food. There are considered to be three classes of meat generally in Dundee; first, second, and third classes; that animal would go under the third class.

By Mr MACKAY.—I have seen diseased beasts after they were slaughtered.

Mr MACKAY.—And will you swear there is no disease about this one?

Witness.—Well, so far as I know, there is not. The lungs appeared to be sound. I saw that the beast had been "sloughed" out; a "slough" had been taken off the ribs.

Mr MACKAY.—Did you not see the remains of yellow stuff there?

Witness.—No; none.

About half-a-dozen other witnesses were called by name, but none of them answered. The only other witness examined for the defence was

A flesher named NICOLL, who deponed—I examined the two animals now lying in the courtyard. In my opinion the one nearest the gateway is fit enough for human food. There is nothing wrong with it that I saw. It is a third-class animal.

By Mr MACKAY.—Will you undertake to say there has been no disease about that animal?

Witness.—I could not say that it has not been diseased at some former time, but it is not diseased now. The lungs are quite wholesome. The beast is a little old, but there is nothing wrong with it.

Mr MACKAY.—What do you say to the other beast?

Mr PAUL said there was no need to go into that.

Mr MACKAY.—Were you ever in Court yourself, Nicoll?

Witness.—Well, I was once.

Mr MACKAY.—And for unwholesome meat?

Witness.—Well, they made it unwholesome when they got it here. (Laughter.) But that is long, long ago. I was fined L.2.

This closed the case for the defence.

Mr MACKAY, for the prosecution, pointed out that the charge was for being in possession of the carcase, or for being "art and part;" and although Doig had been punished for his share in the transaction, that did not prevent Ogilvy from being also found guilty. He could clearly understand the nature of the defence which was likely to be set up on the fact of Doig having pleaded guilty. It would no doubt be this, that, seeing that Doig had pleaded guilty, and had taken on himself the responsibility of this animal being his property, therefore the guilt was removed from Ogilvy's shoulders. But this was a most fallacious idea, and would not stand the test for one moment; and although only one animal was found to be diseased, it answered the purpose of the prosecution equally well, because both were the property of Ogilvy as surely as they were the property of Doig, "or one or other of them." Mr Mackay proceeded to contend that, in the face of the evidence which had been led in support of the charge, there could be no reasonable doubt that the meat was diseased; and supposing that the theory he had suggested was correct, that the disease commenced in the blood, it was clear that it would affect the whole system of the animal so soon as it made its appearance. But on the other hand, if that theory was not correct, and the disease really commenced in the lungs, as was held by some to be the case, then the moment it appeared in the lungs it spread itself in the blood, and contami-



nated the whole system in a very short time. In these circumstances, he submitted that the magistrate should return a conviction against Ogilvy, notwithstanding the previous one against Doig. Mr Mackay then alluded to the suspicious circumstances in which the animals were sold to Ogilvy. He did not wish to say anything harsh against the woman who sold the beasts, but he only wished that the law was sufficiently wide to place her beside Ogilvy at the bar. It was where she ought to be. It was in vain to say that any person would sell two beasts like these on the terms she did—one of them for L.5 with L.1 promised, and the other beast thrown in as a luckpenny—unless she was perfectly conscious they were diseased. No one could be expected to believe such a story. He with the greatest confidence asked the Magistrate for a conviction in this case. This was a class of offences which he thought ought to be severely dealt with. A traveller met by a highwayman on the road might have the means of defending himself, but against this system of poisoning a man had no means to protect himself and his family. A man would be entitled to oppose force to force if his life or property were in danger from open violence, but here there were no means of defence, and it was frightful to contemplate the results of such a traffic. He did trust that the law would soon be made stronger to put it down.

The BAILIE.—Do you ask for a conviction on both animals?

Mr MACKAY.—Yes, on both animals.

Mr PAUL, for the defence, said his Honour would observe that the charge against the defender was that he had in his possession the carcase or carcasses of one or two animals which were diseased and unfit for human food, and that these were not set aside and ticketed as such, as required by the Act. Now, it was shown by the evidence for the prosecution, that one of the animals had been seized while it was being dressed, and that, therefore, the parties who had it in their possession had not an opportunity of ticketing it. With regard to the other animal which was set aside, he thought it had been proved that it was not diseased, but that it was only a third-class animal showing no symptom of disease—that it was a lean animal, and one which had no doubt done good service to Dundee, but that it was not such as should have been condemned as unsound. He contended further, that as the Act of Parliament stated that the party to be pursued was the person in possession of the animal, or the owner, therefore Doig, having been convicted for having it in his possession, the charge against Ogilvy must fall. They could not summon both parties, and condemn both. They might summon both, and single out the guilty person; and as Doig had already pleaded guilty to having had the carcase in his custody, the Magistrates could not fine another man for the offence of which Doig had been convicted.

Mr MITCHELL, the Assessor of Court, said it was very plain that both of these animals belonged to Ogilvy, and the person to whom they belonged was liable for them. He did not agree with Mr Paul in his reading of the clause in the Act, that the animals must be killed and dressed before they were set aside as diseased and unfit for human food. He also stated that the Magistrate was entitled to fine the party convicted L.10 for each beast.

Bailie YEAMAN, in giving judgment, went over the evidence very carefully, pointing out that there was sufficient skilled testimony to the fact that the carcasses were diseased. Then there was the fact that Ogilvy had bought this cow from Mrs Thompson for L.5 down and L.1 promised, and that she gave him the other cow in a present—as a luckpenny——.

Mr MITCHELL.—Saying it was rotten!

Bailie YEAMAN continued.—There was no doubt that Mrs Thompson knew that both of these cows were diseased, otherwise she would not have been such a fool as to have sold them for L.5. That told a strong tale; and he (the Bailie) had no doubt that at that time Ogilvy knew most distinctly that he was purchasing diseased animals, and which were unfit for human food. There was not a man in Dundee who ought to be a better judge of that class of animals than the prisoner, from the very large dealings he had had in them, as was proved by the many convictions against him before that Court. It was extraordinary that the



town of Dundee had allowed the law on this matter to continue as it was for such a length of time. It was very evident that the power the Magistrates had in these cases was not sufficient to put down the traffic—at least it had not been so in Ogilvy's case ; and he was surprised that the public would continue to patronise any man who carried on such a nefarious business. The result of it was, according to all evidence, disease and death ; it was a retailing, as it were, of slow poison. It was really a very reprehensible traffic, and he thought the law in regard to it should make dealing in such meat a crime, so that the Courts might have it in their power to inflict punishment of a lengthened period of imprisonment. Under all the circumstances, he had no hesitation in finding Ogilvy guilty for both the animals, and fining him L.10 for each, and failing payment, to suffer sixty days' imprisonment for each offence.

OGILVY.—The beast was one of the soundest beasts in the world.

The BAILIE.—I may say that I do not regard this as a suitable punishment for the offence which has been committed, but I feel it to be my duty as a Magistrate to impose the highest penalty in my power.

OGILVY.—The beast was one of the soundest that ever was in a flesher's shop.

The BAILIE.—And I will say farther, as one of the Commissioners of Police, that I hope it will not be long before we have further power which will enable us to put down this traffic altogether.

After a short consultation with Mr Mitchell,

The BAILIE said that, after consulting with the Assessor, he would only impose a penalty of L.10, or sixty days' imprisonment, for one of the animals——

Mr MACKAY.—Or for both animals ?

The BAILIE.—Yes, one penalty for both animals.

OGILVY repeated his statement that the lungs of the animal were perfectly sound. It was as sound an animal as ever was in Great Britain.

Mr MITCHELL said if Ogilvy again appeared there on such a charge, the Magistrates would have to adopt a different course with him.

OGILVY.—It's no your fault that I have not been banished long ago.

### CONVICTION OF A SCOTCH CATTLE-DEALER FOR SELLING DISEASED MEAT.

At the London Central Criminal Court on the 16th ult., before Mr Commissioner Kerr, Alexander Stewart, a cattle-dealer in Perthshire, was indicted upon a charge of having caused to be exposed in Newgate Market 300 lbs. of diseased meat, the same being wholly unfit for human food. There were also four other counts in the indictment. Mr Sleigh, Mr Poland, and Mr Nicholson prosecuted ; and Mr Metcalfe defended the prisoner, who pleaded not guilty. From the very voluminous evidence laid before the court, it appears that a person named Fairleigh lives at Coupar-Angus, in Perthshire, where he carries on the business of pig-jobber and shoemaker ; and in September he was possessed of two cows which appeared to be suffering from a disease of the lungs, and which Fairleigh therefore desired to dispose of to the best advantage. The prisoner resided close by, and on hearing that these two cows were for sale, proceeded to Fairleigh, and after some bargaining, ultimately agreed to give him L.3 for the two. Fairleigh consented, the prisoner gained possession of the cows, and at once engaged the services of a killer ; the cows were slaughtered, and were nicely dressed, and then consigned to a Mr Leigh of Newgate Market. In due course the inspector of meat came round, and seeing the state of the meat consigned by the prisoner to Leigh, at once pronounced it unfit for human food. It was taken before a magistrate, and there and then condemned, and proceedings taken out against the prisoner.

For the defence Mr METCALFE addressed the jury at considerable length, urging that it could not be denied that the prisoner had sent the meat to Mr Leigh, but



at the time he did so he was quite unaware that it was unfit for human food, and he was therefore clearly entitled to an acquittal.

The Commissioner summed up at considerable length. The jury immediately returned a verdict of guilty.

Mr Commissioner KERR asked the meat inspector what effect this bad meat would have upon people if partaken of?

The officer said, according to Dr Letheby, carbuncles would be produced upon the body, as well as diarrhoea of a very severe nature, and in many cases death would result.

Mr Commissioner KERR, addressing the prisoner, told him he had been convicted, after a patient hearing, of a most serious crime ; indeed, he did not know of anything more serious. Death might result from the bad meat being partaken of, and if so, of course it was little short of murder. This kind of thing was very largely on the increase, and it was his duty to pass a very severe sentence. It had come out in evidence that his own men, when he had killed the cows, had cut the lungs up, and found them to be diseased, and had afterwards told him (prisoner) so. Certainly he could not think of anything more reprehensible than his conduct had been throughout the whole proceeding. It had appeared from the evidence that a very large quantity of bad meat came from the neighbourhood of Coupar-Angus, and he hoped that after the sentence which he intended to pass had been recorded, the people about that locality would be more careful for the future what they sent to London in the shape of meat. The Commissioner then sentenced him to be imprisoned for the space of twelve calendar months ; at the expiration of which time to pay a fine of L.50, or to be imprisoned until such sum should be paid. The prisoner was then removed, when Mr Commissioner Kerr severely censured the first witness, Fairleigh, who had sold the prisoner the cows ; and he expressed his opinion that he (the witness) ought to have been placed in the dock with the man Stewart.

---

## ACTION FOR THE PRICE OF A HORSE.

SUMNER *v.* COATES.

(*From the Royal Leamington Spa Courier, December 12, 1863.*)

THIS was an action brought by Mr Sumner, wholesale druggist, Birmingham, against Mr Coates, livery-stable keeper and horse-dealer, Leamington, to recover the price of a horse sold to the latter for L.30. Mr Brown appeared for the plaintiff, and Mr Sherwood for the defendant.

Mr BROWN said, the plaintiff having a horse to dispose of, instructed a Mr Sankey, of Birmingham, to sell it for him. Mr Coates afterwards made inquiries about the horse of Mr Sankey. In the course of a conversation which occurred, plaintiff was asked whether he would warrant the horse, and he replied that he would not warrant him the length of his shop, but he had no objection to its being examined by a veterinary surgeon. Mr Sumner at the same time said it was not his practice to warrant horses, but if he liked to have this one examined he could do so. Mr Coates had offered L.25, but the bargain was not completed between Sumner and Coates. It was ultimately agreed between Coates and Sankey that the horse should be sold to the former for L.30, if it was passed by Mr Edward Stanley, veterinary surgeon, at Birmingham. It was arranged that the horse should be examined by Mr E. Stanley next morning ; and if approved, it was to be sent to Leamington. Mr Stanley passed it, and it was accordingly sent to Mr Coates, who being at Birmingham the same day, was told what had been done by Mr Sankey's manager. In a few days afterwards Mr Coates chose to have the horse examined by another veterinary surgeon, although how that could affect his client's case he was at a loss to conceive, inasmuch as the bargain had been completed by the horse being passed at Birmingham. However, the



horse was examined at Leamington, declared to be unsound, and was sent back to Birmingham, where it shortly after died.

WILLIAM SUMNER, the plaintiff in this action, said he was a wholesale chemist and druggist in High Street, Birmingham. He remembered Mr Sankey coming with the defendant to him on the 17th of September last year. Mr Coates asked him what he wanted for the horse he had for sale, and he said L.40. Defendant asked him if he could warrant the animal sound. He said he would not do so, even the length of the shop. He agreed to have the horse examined by a veterinary surgeon, on the understanding that if the horse was not sound he (plaintiff) should pay the fee, and if he was sound defendant was to pay it. Mr Coates offered him L.30 for the horse, which he refused to take. When defendant left the shop witness told Mr Sankey he was to use his own discretion as to selling the horse for L.30. He had at that time had the horse in his possession for about three months, and in his judgment the horse was in perfectly sound condition.

*Cross-examined.*—Mr Coates said he wanted the horse to send to Scotland to match another horse. Mr Coates might have asked him if the horse was sound; if he did so, he should have replied that the horse was perfectly sound.

JOSEPH SANKEY, dealer in horses, Birmingham, said, he remembered showing to Mr Coates the horse in question in September last. Mr Coates rode the horse twice, and he had every opportunity to examine it before he purchased it. Mr Coates asked Sumner if he would warrant the horse, and he replied he would not warrant him alive. Mr Coates asked if he could have a veterinary surgeon's opinion, and witness said, "Yes, we do not want you to buy an unsound horse." Defendant offered L.30, subject to a veterinary surgeon's opinion. Nothing more was said until defendant and witness got to the Snow Hill Station, when Mr Coates said, "I will give you L.30 for the horse if examined and passed by Mr E. Stanley; if he does so, forward him on to me at Leamington." He considered the horse was perfectly sound at the time of the sale.

*Cross-examined.*—He did not hear Mr Coates ask plaintiff anything about the soundness of the horse. Did not hear all the conversation between defendant and plaintiff.

Mr FRANK G. HAYNES said, he remembered showing a bay gelding, the property of plaintiff, and he saw defendant ride the horse and examine it. He afterwards saw Mr E. Stanley examine the horse, and he gave witness the certificate produced of the horse's soundness. He met Mr Coates the day after the horse was sent to Leamington, and told him what had been done. A few days after the horse was returned, but he (witness) refused to take him in, and he was taken to the repository, where he died. Mr Coates had admitted to him that he bought the horse subject to its being passed by Mr E. Stanley, but that he was not going to be robbed.

Mr E. STANLEY, veterinary surgeon, Birmingham, said, he examined the horse on the 18th September. As the result of his examination he considered the horse sound, and he gave a certificate to that effect.

*Cross-examined.*—He remembered Mr Coates telling him that he had obtained other certificates in reference to the horse. If he knew that Mr Parker and Mr Stanley had given a certificate that the horse was not sound, he should still say that the horse was sound when passed by him. The feet of the horse were what were called thin feet, and he saw nothing in them to indicate disease. Since that he had admitted, that some veterinary surgeons in Leamington were too particular.

This was the plaintiff's case.

Mr SHERWOOD said he could not profess to put the case for the defence on the ground that there had been fraud, but that the acceptance of the horse by his client was only conditional. It depended, in fact, upon his being passed as sound, and he had been passed as such by Mr E. Stanley; but his opinion he impeached, and could produce evidence to show that it was unfounded. It was held that where a vendor warranted an article, whether a specific chattel or not, it



was competent for the purchaser to prove the breach of warranty in pleading for a reduction of damages ; in fact, the whole of the case depended on the contract.

His HONOUR remarked, that the warranty was disclaimed on the part of the plaintiff, and he was against Mr Sherwood in his contention.

Mr SHERWOOD then called Mr Coates, the defendant in this action, who said he was in Birmingham in September last. He accompanied Mr Sankey to Mr Sumner's place of business. After some conversation with Mr Sumner, he said to Mr Sankey, to save expense, it would be better to have the horse examined. Sankey said, " Very well ; who will you have ?" He replied, " Mr E. Stanley," and if he passes the horse he could send it to him with a certificate, and he would return a cheque for L.30. When the horse had been at Leamington a day or two, his attention was called to an enlargement on the horse's knee, and also his bad feet. Witness had the horse examined by Mr Stanley, at Leamington, and another gentleman, and then sent the horse back to Birmingham. When witness went to Birmingham on the following Monday, he saw Mr E. Stanley and told him about the horse. He said some veterinary surgeons were too particular, but they could not do that in Birmingham. He did not remember Mr Sankey warranting the horse ; Mr Sumner would not do so, but said witness might have a veterinary surgeon's opinion. He had the horse examined by Mr Parker of Birmingham, as well as by Mr Stanley of Leamington.

His HONOUR here intimated, that so far as the case had proceeded it was entirely in favour of the plaintiff. Mr Coates in his evidence had admitted, that the bargain was made as stated by the plaintiff.

Mr SHERWOOD reminded his Honour, that Mr Coates had the certificates of two veterinary surgeons, which were entirely different to that of Mr E. Stanley's.

His HONOUR.—That may have been an afterthought. I think, as far as the main facts go, that the case is in favour of the plaintiff.

Mr SHERWOOD expressed a wish to examine Mr Stanley and Mr Parker.

His HONOUR said he hardly saw how anything could be made out of their evidence. The bargain was made by Mr Coates himself, and his directions were followed.

Mr BROWN thought the evidence of Mr Stanley and Mr Parker was wholly irrelevant.

His HONOUR said, those gentlemen's evidence would not affect the real question at issue. The defendant himself had proved a good witness for the plaintiff, as he substantiated his evidence. The evidence and the certificates of the two veterinary surgeons would not alter his opinion, which was in favour of the plaintiff. He thought it would be much better, for reasons which were obvious to all of them, that these gentlemen should not be brought into collision with each other, which would cause a division amongst professional men.

Mr SHERWOOD remarked, that Mr Stanley was present to support his certificate.

His HONOUR.—Just so ; but we may assume that he has done so without his being examined in a public Court. In fact I think we are at the end of the case.

Mr BROWN.—There is a singular fact in regard to the certificates of Mr Stanley and Mr Parker ; one gentleman says the horse was lame on the off fore leg, while the other says it was the near fore leg.

Mr COATES.—That is wrong ; Mr Stanley never said the horse was lame at all. Mr Stanley's certificate was read, in which he said that he found an enlargement of the tendons on the right fore leg.

Mr BROWN.—Well, Mr Parker found something on the other leg, by which he implies that the other leg was quite right.

His HONOUR.—He might have meant to say that the other leg had been dealt with.

After some conversation Mr Stanley, veterinary surgeon, Leamington, was examined : He said he carefully examined the horse in question, and the certificate which had been read was correct. The value of the horse, taking into consideration that he was unsound, would be in his opinion from L.10 to L.15.



*Cross-examined.*—There was a conspicuous enlargement on the off fore leg, which would have a tendency to lameness, and he should think it would be permanent. One leg was as bad as the other. Mr Parker, veterinary surgeon, said he examined the horse in question, and found that he was lame in the near fore leg, and therefore that he was unsound.

*Cross-examined.*—Both the horses' legs were bad.

His HONOUR said, he could not consider that there had been any breach of warranty in this case, and therefore he must give a verdict for the plaintiff for the full amount claimed, with costs.

---

## PERISCOPE.

---

### ON SPLENIC APOPLEXY, SO CALLED.

By EDWARDS CRISP,\* M.D., F.Z.S., &c., late Physician to the Metropolitan Dispensary.

(*From the Bath and West of England Agricultural Journal.*)

THE disease which I am about to treat of is most inscrutable and mysterious, sudden and insidious in its invasion, and often kills more rapidly than arsenic and other potent poisons. An animal may feed well, and be apparently in excellent health, and yet in three or four hours may drop dead from this affection. A cow has given her usual quantity of milk at six o'clock in the evening, and before ten she has died of this disease. There is no malady, I believe, which affects human beings that has any resemblance to it. The spleen in man occasionally ruptures spontaneously; it is not unfrequently enlarged, it may be gorged with blood, and in diseases of a low type, such as malignant fevers, its contents are often soft, pulpy, and disintegrated; but disease of the spleen itself but rarely terminates fatally in this country. According to the Report of the Registrar-General, under the head of Disease of the Spleen, in fourteen years, from 1840 to 1853, the numbers for each year were 4, 2, 9, 7, 4, 9, 16, 3, 12, 11, 12, 13, 16, and 12, respectively, but probably in the great majority of these cases other organs were unsound.

Before we are competent to understand the nature of a disease, it is necessary to know something of the structure and use of the organ affected, and I will first endeavour to put the reader in possession of a few facts that will enable him better to comprehend the subject, especially as a vast amount of error prevails respecting this organ. I could enumerate many examples, but one will suffice. It is generally believed among stable-men and others, that a horse has no spleen; the condensed mucus brought from the colt's stomach being mistaken for it.

I have examined the spleen in many hundreds of animals,† mammals, birds, reptiles, and fishes; I have estimated its weight relatively to the body, to the other viscera, and to the length of the alimentary canal; I have shown that the assertion, made by Cuvier and all writers since his time, that the spleen diminishes in size as we descend in the scale, is erroneous, and that in several fishes and reptiles it is proportionally larger than in many mammals; and that valves, said

---

\* I may state at the commencement of this paper, that I pursue these investigations, as mentioned in my Prize Essay on Parasites in Lambs, published in the last number of the "Journal," under the belief that I shall throw some light upon human pathology and treatment.—E.C.

† "Structure and Use of the Spleen," 1852.



by all writers to be absent in the splenic vein, are present in many quadrupeds : a fact, as I believe, *that has an important bearing upon the disease in question.*

The spleen or milt, in quadrupeds, is a soft, spongy, vascular body, varying in shape in the different orders of animals. It is seated on the left side of the stomach, and is in contact with the pancreas or lower sweetbread ; it has no duct or passage for the conveyance of its secretion, like the liver and kidney, but it is made up of a great number of elastic bands like india-rubber, which allow of great distension. Between these elastic bands are placed small round bodies that secrete probably an albuminous material that passes into the blood. To give the reader some idea of the elasticity of the organ, I have injected six pints of water into the spleen of a dray-horse, and six ounces into that of a sheep. The spleen of an ox may be distended with air, to the extent of four or five pints. The same spleen twenty inches in length, may be extended to thirty-one inches, and when the distending force is removed, it returns to its normal size. So that without going into unnecessary detail, the reader may infer that one of the offices of the spleen is to act as a reservoir for the blood in connection with the digestive organs, and in those states of the system in which the blood is driven from the surface to the interior. Another and more doubtful function, is that of secreting an albuminous material which serves some useful purpose in the animal economy. I could fill pages with the opinions of authors respecting the use of the spleen, but the correctness of most of them is disproved by a careful examination of a large number of vertebrate animals. Professor Simmonds, in a paper on Splenic Apoplexy, published in the last number of the Journal of the Royal Agricultural Society,<sup>1</sup> inclines to Kolliker's opinion, and says, "that the total quantity of solid matter in the blood of the splenic vein is often less by one-half than in the other vessels." This statement I entirely discredit, but, if it were correct, it would not in any way support the disintegrating theory ; for, unaccountable as it may appear, those who subscribe to it have entirely overlooked the important fact that the blood of the splenic vein of the horse, from which the analysed blood was taken, contains a great portion of the *used* blood of the stomach. Some writers have shown a large amount of ignorance respecting this organ. Thus, Professor Rymer Jones, in describing the spleen of the horse ("Cyclopædia of Anatomy and Physiology"), says "its average is 12 ozs.;" but the average weight of the spleen of 76 London horses, including cobs and ponies that I have weighed, was 54 ozs. I make these remarks for the purpose of showing upon what insecure bases some physiological theories are built.

The relative weight of the spleen to the body in some of our domestic animals in tolerable condition, will be about as follows. In fat animals I have found the spleen, like the rest of the viscera, is proportionately smaller : horse,  $\frac{1}{450}$  ; hog,  $\frac{1}{600}$  ; ox,  $\frac{1}{800}$  ; sheep,  $\frac{1}{280}$  ; dog,  $\frac{1}{320}$  ; cat,  $\frac{1}{500}$  ; cock,  $\frac{1}{1000}$  ; duck,  $\frac{1}{2840}$ . I speak from my own researches. In many animals, as in the serpents, that have long fasting periods, the organ is relatively smaller ; whilst in alligators, turtles, tortoises, toads, and frogs, it is much larger, and in fishes that increase rapidly and consume a large amount of food, the spleen often attains a large size. As is well known, an animal may be apparently in good health without a spleen. I have removed it from several rats, cats, dogs, and pigs. Let me give one practical example differing, I believe, from all other experiments of the kind in being a *comparative one*. Out of a litter of ten setter puppies I rescued four from drowning ; I removed the spleens of two of them, under the influence of chloroform, when they were eight days old ; the wounds soon healed without an untoward symptom ; the four pups were kept together, and those without spleens exhibited the same amount of strength, activity, and sagacity, as the others. I examined the temperature, blood, fæces, and urine at various times, and could find no difference between the perfect and the spleenless. One of the spleenless pups, the most active of the four, died from an accident. I then kept two only for experiment. I took them out, when partridge-shooting, on a hot day in September, and the only dif-

<sup>1</sup> See abridgment in this Journal, vol. xi. pt. 1. p. 200.



ference I observed was that the spleenless dog was the faster of the two ; they were treated and fed exactly in the same manner, and were killed under chloroform when about ten months old. A careful comparative analysis was made of the blood by a good chemist (Dr Paul), and no important difference was detected. The spleenless dog, originally the smaller, was excessively fat, and weighed 45 lbs. when killed ; the other, with a spleen, 32 lbs., but I need not enter into further particulars. The reader may naturally ask, if this organ plays apparently so unimportant a part in the animal machinery, how happens it that a derangement of its organization, like that in Splenic Apoplexy, will lead to such speedy and disastrous results ? In answer to this question it may be remarked, that there is a wonderful and beautiful law of compensation in the animal economy, so that when the function of one organ is deranged or destroyed, another takes its office, and that many parts of animal bodies may be removed with impunity that will occasion death when in a state of disorganization. With these explanatory remarks, I pass on to the immediate subject of the paper—*Splenic Apoplexy* (so-called).

Until very recently I have failed to find any description of this disease in our English veterinary publications. A few cases are given under another name, but the disease appears to have been much neglected in this country. I know of none of the older writers who have described it ; nor is it mentioned, I believe, in any of our modern books on the diseases and treatment of our domestic animals. Youatt, in his "Treatise on the Horse" (1843), does not mention it : in his "Treatise on Sheep" (1837, p. 442), he speaks of "a disease of the spleen occurring mostly in July, August, and September, first described," he says, "by M. Tochentin of Baden." "The sheep are said to die in a few days, and sometimes suddenly. The liver is said to be partially decomposed, and the spleen enlarged and filled with tubercles and ulcers." I may remark that I have never seen such appearances as here described. In his "Treatise on Cattle" he alludes to a disease that runs its course in a few hours : he calls it inflammatory fever. "The spleen is large and disorganised, the liver gorged, and the viscera congested. Over-driving and luxuriant pasturage are supposed to have been the causes." In the "Transactions of the Veterinary Association" (1843), Mr Meggins of Horsham, Sussex, is reported to have brought before the Veterinary Society several cases of death in oxen and colts, evidently from this disease. The spleens were all enlarged, and their cells filled with blood. The President, Professor Spooner, thought that the disease bore some resemblance to "red-water." In the "Veterinary Record" (1845), edited by Professors Spooner, Simonds, and Morton, Mr J. Howell mentions the death of eight cows from a singular disease affecting the spleen. In the same Journal (1846), Mr Webb mentions eight cases, as I believe, of this disease, under the head of *Splenitis*, inflammation of the spleen. In the "Veterinarian," edited by Professors Morton and Simonds, from 1840 to the present time, with the exception of the Report published in the "Journal of the Royal Agricultural Society" already alluded to, I only find two notices of this disease, but not under this name. In 1851, Mr Laycock of Hust Courtney, lost six cattle out of eight affected ; and in 1856, Mr Foster of Spalding, speaks of nine cows that died apparently from this affection. In January 1857, the disease broke out on a farm in Northumberland, where there were 300 head of cattle. Twenty-three died of this disease, which appeared to cease spontaneously in February ("Edinburgh Veterinary Review"), 1862. In the same Journal (1862), Mr Dickinson, veterinary-surgeon, of Boston, records several cases of oxen brought from the fields into the crewyard, and highly fed : the spleen of one weighed 16 lbs. For the year 1862, Professor Gamgee obtained returns from 250 veterinarians in England, Ireland, and Scotland, respecting the health of stock ("Edinburgh Veterinary Review," May, June, July, 1863) ; and I find that seventeen of the respondents speak of the occurrence of the disease in their districts ; but in no instance did it appear to take on an epidemic character, nor is its contagious nature hinted at.

It is difficult to ascertain when splenic apoplexy was first observed ; but it probably existed in this and in other countries for a long time without recogni-



tion ; and I am persuaded that a vast number of animals, horses, oxen, and sheep die annually from this lesion, whose deaths are not attributed to the proper cause. In conversing with agriculturists I have found that several of them have lost animals, as I believe, from this affection : horses, sheep, and oxen, that were apparently well at night, have been found dead in the morning, but no endeavour was made to ascertain the cause of death.

In France, it appears to have been much more prevalent, especially among sheep ; and it has been known and described for a long period. M. Tessier, I believe, first used the term *sang de rate*, or splenic apoplexy, in his "Instructions sur les Bêtes à Laine" (Instructions on Sheep), published in 1810. Other names have been given to the disease, such as *coup-de-sang*, blood-stroke ; *grosse rate*, great milt ; *fièvre charbonneuse*, black or malignant fever. The mortality in several districts in France among sheep has been very great. M. Larpenteur (Recueil de Méd. Vétérinaire, Paris 1857) calculates that in the district of La Beauce the losses in sheep annually amount to three millions of francs ; and in the same Journal, M. Moisant speaks of a farmer in this district (La Beauce) that lost twenty-four sheep in one day from this affection.

I believe that I was the first specially to direct the attention of the medical profession in this country to this singular disease, in my work on the "Structure and Use of the Spleen," written in 1849. As this work is now out of print, I think the enclosed extract (p. 168) may with propriety be introduced, as it bears especially upon this investigation :—

"I now, in conclusion, allude to a condition of the spleen in the lower animals which requires further investigation.

"During the period that I was attending especially to the pathology of this organ (the spleen), I made inquiries of extensive agriculturists and those engaged in the management of cattle, as to the state of this viscus in epidemic diseases, and other affections in sheep and oxen. I received some strange communications on this subject, to which at the time I attached but little importance, but subsequent research has led me to regard them with much interest. I subjoin two or three of these. Mr J. Williams, of Timely, on the eastern coast of Suffolk, lost forty oxen in one year (from October to June), which were turned into a marsh near to the sea. The spleens of all that died were black and bloody, and many of them weighed 20 lbs. Eight sows that ate the spleens died within twenty-four hours ; and many pigs were killed in the same manner. Four or five colts in the same marsh also died very suddenly, drinking large quantities of water for several minutes before death. I naturally looked upon this statement with some suspicion, and I wrote to Mr Steel, the veterinary surgeon, of Bucklesham, who gave the farrier's evidence respecting the death of these animals, and stated that in three oxen that were slaughtered during his attendance, the autopsy showed the disease to have been pleuro-pneumonia, and that the spleen was unaffected.

"About the same time, I received the following information from my brother, Mr Thomas Crisp, at that time of Chillesford, Suffolk : 'Mr A. lost an ox last summer (1850), which was fed on marshy ground, from disease of the spleen. This organ was two feet long and one in width, and much ulcerated, bloody, and pulpy, so that it readily fell to pieces. The butcher who handled this spleen had his arm so affected that he was unable to use it for some time. Cats died from eating it, and a sow that ate the paunch and a part of the spleen also died. In another instance, an ox was supposed to have died from diseased spleen, the organ weighing eighteen or twenty pounds. A sow died after eating a part of the spleen, and a man who cut his finger whilst removing it from the body states that the wound did not heal for many weeks.'

"I have before observed, I did not attach much importance to the above statements, believing that they were exaggerated, and that false inferences had probably been drawn from results that would admit of a different interpretation. Since then, I have obtained evidence of a like nature from Mr Cooper, of Great Oakeley, Essex, and others, so that I have now no doubt as to the correctness of



this information. On looking over the 'Mémoires de la Société de Biologie,' (Paris, 1851, p. 141), I find, according to M. Rayer, 'that a large number of sheep in certain districts in France have died of a disease called *sang de rate*. Sheep inoculated with the splenic blood died in less than four days, petechiæ and ecchymoses of the lungs being present as in the *sang de rate*.' M. Barthelemy performed similar experiments in 1823. The first sheep died in sixty hours; another inoculated from this, died in thirty-six hours; others from thirty-six to forty-eight hours; a horse, in eighty-eight hours, and a sheep inoculated from this horse, in fifty-three hours. The disease produced great ravages among the sheep in certain districts in France.

"There are some facts, however, yet to be determined, viz., Is this poisonous matter more virulent in the spleen? Is it confined to this viscus, or does it pervade other organs? The question is one of great interest and importance, and it may turn out hereafter that in some low forms of fever, and in some malignant epidemics, a poison of a peculiar kind is generated in the spleen. I have already quoted the opinion of M. Anber (page 151) concerning the *typhus icterodes*, which proved fatal to 2000 of the population of Moscow in thirteen months, 'that the putrid and purulent spleen was the cause of the fever.'"

Since this period I have had a great many opportunities of examining animals that have died of this disease. At the Zoological Gardens, Regent's Park, deer, antelopes, and sheep, have sunk in a few hours, and without any apparent cause. I have found the spleen enlarged, pulpy, and disintegrated; the upper part of the intestines dark and congested, and blood sometimes in the canal, the blood generally fluid, and of a violet colour; but the most remarkable phenomenon is the early decomposition in many of these cases, and the generation of gas, so that the serous membrane covering the kidneys and other parts is detached from the viscera. The animals die quickly and without any apparent cause; in all cases I have observed that the paunch has been distended with food, but I omitted to examine the state of the valves in the splenic and stomach veins.

**SYMPTOMS AND MORBID APPEARANCES.**—The symptoms of this complaint are not always uniform; indeed their termination is often so sudden that they escape notice, for in many cases an animal will continue to feed until the time of its death. In other instances animals—horses, oxen, and sheep—are found dead without having manifested any apparent deviation from health; sometimes only one animal is lost on a farm, but more generally the disease is fatal to several. Splenic apoplexy, I think, may properly be divided into the malignant and the mild forms; the first being invariably fatal in a few hours; in the other, animals not unfrequently recover. In the malignant form the animal is dull, off its feed, the head is down, the back more or less arched, the gait unsteady, the pulse quick and feeble, and towards the termination of the attack the breathing becomes difficult, and convulsive twitchings affect the muscles, the urine and excrement are sometimes bloody, and occasionally bloody froth appears about the mouth and nostrils; the animal frequently falls dead when standing, in from four to eight hours from the commencement of the attack. In other cases death takes place very quickly, without many of the above-mentioned symptoms being present. I have known many examples of this. The milder form of the affection is generally made known by the death of animals in the same shed or field, and the symptoms are of a more mitigated character. In the horse I have not met with a recorded case where the urine and fæces have been bloody, but the death in this animal is often very rapid. In the sheep the symptoms are often less marked than in the horse, and the disease generally in this country is undetected until after death. Some cases are mentioned by the French writers where death has taken place in half an hour from the first appreciable symptoms, and it generally happens that the most vigorous and healthy animals are the first to be attacked.

**MORBID APPEARANCES.**—These are partly described above, but all the after-lesions appear to arise from the disintegrated state of the blood, so that in many parts, without any actual rupture of a vessel, the blood exudes through its coats, and occasions the ecchymoses, exudations, and extravasations, that have been



described. In most instances in oxen, sheep, horses, deer, and antelopes, I have found the spleen large, soft, and pulpy, with extravasation of disintegrated blood from its proper vessels. In some cases, however, in oxen that have died rapidly, the spleen has not been much enlarged, but always soft and pulpy. The weight of one bull's spleen that I examined was about 24 lbs., and the increase evidently very rapid. Sometimes the blood is extravasated under the capsule of the spleen, as well as to the interior. The skin, too, and the cellular tissue beneath it, as well as the muscular substance in some parts, in the malignant form of the disease, are not unfrequently livid or violet-coloured, from extravasation of blood. This is generally more apparent over the region of the spleen. The blood is mostly fluid, and of a violet colour. In some cases I have found it of a treacly consistence. On examination under the microscope I have observed many of the blood-corpuscles to be lax and irregular in form, and those that have a normal shape are difficult to preserve on glass, although healthy corpuscles may be so kept for an indefinite period. I have generally seen long, narrow, acicular crystals, moreover, in the blood of animals affected with this disease, but I have seen apparently the same crystals in other blood.

Besides the cases alluded to I have investigated many others that have occurred since this period. Mr Wolton, of Newborne, Woodbridge, Suffolk, a few years since lost some valuable horses from this disease, and subsequently the same gentleman lost several oxen. In the case of one horse, nearly all the viscera, including the stomach and its contents, were sent to my house, and I made a most careful microscopical examination of all parts, but I failed to detect any satisfactory cause for the lesions met with. I had the contents of the stomach examined by an able chemist, and nothing deleterious was discovered: the food, too, and everything connected with the locality, were minutely inspected, but with a like result.

I could give many other examples of the occurrence of this disease that have come within my own knowledge, but their enumeration would lead to no practical result. I have, however, recently had an opportunity of examining the viscera of several oxen that have died of this disease. I, moreover, saw some of the animals during life, and had an opportunity of inspecting carefully the food, and everything connected with the locality. It is unnecessary here to give the name of the proprietor, and I need not enter fully into the symptoms and morbid appearances, as they differed in no important particulars from those I have already described.

The district in which these cases occurred is a very healthy one generally, and the disease had never been known on this farm before. Ague of late years has been more prevalent among the rural population than formerly. This outbreak occurred in April last, and the animals affected were all stall-fed upon beet-root, chaff, and oil-cake. Eight heifers and four bulls died, all valuable animals, and only one—a bull—that was attacked, recovered; but it is not clear to me that he had the disease. The man who fed him said that he had eaten only two bushels of cut beet for his breakfast, instead of  $2\frac{1}{2}$  bushels, his usual quantity. The disease occurred in two separate sheds, about a mile apart, and no communication had taken place between the animals; but they all had the same beet-root, and at first it was thought that it had not been sufficiently exposed to the air after being taken from the clump. This root was growing on land manured with ooze from the salt-water river, and in addition five cwt. of salt was used per acre. Those attacked had the beet, and afterwards it was given to the animals in the other yard, where the disease soon appeared. I examined this beet carefully, but there was no evidence of the existence of fungi or confervæ upon it. It is a circumstance worthy of note that in the outbreak in Northumberland already alluded to, most of the animals that died had swedes grown on one particular field.

Some of the animals that I have spoken of died very rapidly. They had generally twitchings of the muscles a short time before death, and those that were not killed fell down dead. I could only obtain a little of the urine of one of them,



and in this I discovered no albumen ; but this matter deserves future inquiry. The spleen of one bull weighed about 24 lbs., whilst that of another was not much above the natural size. None of these animals were paralysed, and only two had bloody urine.

Fourteen pigs that ate the blood of some of these beasts died ; their throats were swollen, they had great difficulty of breathing, and their veins were distended with the violet-coloured blood before named. I examined the tongues, throats, and windpipes, of five of them. The root of the tongue and parts around were covered with a whitish false membrane, very like that seen in diphtheritic affections in the human subject. It is possible that such a condition of throat may have been occasioned by the immediate contact of the deleterious matter ; for it is remarkable that in other instances I learn that pigs that have eaten the blood and entrails of animals dying of splenic apoplexy have had externally the same condition of throat.<sup>1</sup> The spleens of these pigs were soft and pulpy, but not much enlarged. It is curious that two pigs had given to them the blood of another diseased ox, and were apparently unaffected. The keeper's dogs also ate of the viscera with impunity, and I gave a part of the spleen of the bull above mentioned to four young ravens, and they also escaped injury ; but the spleen had been removed four or five days, and the poisonous matter may have disappeared, as in M. Garreau's experiments before quoted.

On a farm about three miles from the above-named, one stall-fed ox died of splenic apoplexy ; it was in excellent condition, and was fed upon turnips, oil-cake, and hay ; two others were afterwards killed, but the gentleman to whom the oxen belonged informs me that they were not affected with this disease : the other animals in the same yard continued well.

One of the most remarkable phenomena connected with this disease is the effect produced by the spleen and other viscera of the beasts affected upon man and the lower animals. In addition to the cases just related (see also below and on next page), I have obtained other evidence of a like nature, and it cannot be too generally known amongst agriculturists that persons who flay animals dying of this complaint should be careful to avoid scratches, cuts, and punctures, and on all occasions to wash the hands well immediately after they have finished. If a cut is received, the *immediate* application of salt or of spirits of turpentine to the wound will probably be the best remedy.

Four men who flayed the last-named animals suffered more or less from sores on the hands, which were a long time before they healed, and two of them had much constitutional disturbance. Mr Hamilton, one of the Commissioners for New South Wales at the late Exhibition, informed me that when this disease was prevalent in that country, the men were so disabled from punctures and the imbibition of the poison when flaying the sheep, that they refused to flay any more unless they received an amount of pay adequate to the risk. One man nearly lost his arm from this cause. M. Garreau of Châteauneuf, France, before quoted, punctured his hand when dissecting a sheep that had splenic apoplexy, and malignant pustule appeared after four days, which lasted a long time. I have not been able to find a fatal example in this country, but in the "Archives Générales de Médecine" (Paris, 1859), Dr Cherreau mentions the case of a shepherd, who, in bleeding a sheep that was affected with this disease, received some drops of blood in the eye, which he neglected to wash ; death took place in three days.

The effect from eating the spleen or other viscera is still more extraordinary. Mr Edward Cooper, of Great Oakley, Essex, a few years since lost seven fat hogs from their eating the paunch of an ox that had this disease, and only last week (August 1863) a man in the same village lost 13 ferrets from a similar cause. Mr Dickinson, Veterinary Surgeon of Boston, Lincolnshire, tells me that he has known one instance of pigs and dogs having been killed in a like manner ;" and

---

<sup>1</sup> I am not aware that the false membrane has been before noticed. I have wax casts of these specimens, which I will be glad to show to any one interested in the subject.—E. C.



Mr Mackinder, Veterinary Surgeon of Peterborough ("Edinburgh Veterinary Review," 1863) says: "some pigs were killed from eating the spleen of an ox that died of splenic apoplexy, and 13 that have eaten the offal of a diseased ox suffered severely; some died, and others were slaughtered—all were sent to London." Mr Mackinder informs me that "the animals did not appear to suffer much pain; those examined had the veins distended with blood of the colour of the interior of the spleen." Mr J. Leech, of Bakewell, in the same journal, says that some of the flesh of a valuable bull that died of splenic apoplexy was given to a dog and some ferrets, and all died. Mr Howell, in the cases already alluded to, states that three pigs that ate the flesh of one of the cows died; and M. Dulac (in the "Archiv. Gen. de Méd.," 1859) speaks of many ducks and hens that were killed by eating the flesh of cows that died of this disease. I could multiply examples, but the above will suffice, I hope, to put the agriculturist upon his guard, and to convince him of the necessity of burying at once the bodies of all animals dying of this strange disease. The sooner the carcase is removed the better.

*Cause.*—This is the most difficult and important question connected with this subject, for a proper knowledge of the origin of a disease will often enable us to prevent its occurrence. The solution of this question, however, is a difficult one, and the old saying "*Quot homines tot sententiæ*" is especially applicable with reference to it. My own belief is, that there may be several predisposing causes to splenic apoplexy, but that the exciting cause, whatever it may be, is invariably the same.

1. Does it depend upon the nature or quantity of the food? 2. Is it of malarious origin? 3. Has the water anything to do with its production? 4. Do overstocking and ill-ventilated and ill-drained yards and sheds favour its increase? 5. Is it contagious? 6. Are fungoid or confervoid growths taken with the food, so as to occasion a kind of fermentous poisoning of the blood? On examining a few cases only, we might find evidence that would allow us to answer some of these questions in the affirmative, but a more extended investigation, and the accumulation of a larger amount of evidence, render the deductions less positive. I will answer these questions *seriatim*.

In investigating the first, I may again allude to a curious and interesting fact connected with the mechanism of the animals that are affected with this disease. It is one *never before alluded to*, and I think it well worthy of future investigation. All the animals that are subject to splenic apoplexy—the ox, sheep, deer, antelopes, and probably all the ruminants (as I discovered in 1850)—have valves in the splenic and stomach veins. The horse, mule, and ass also have these valves, their office being to prevent the blood's return into the spleen when on its passage to the liver; those in the stomach-veins, on the other hand, prevent the regurgitation of the blood towards that organ in its course to the splenic vein. Now, it can, I think, be readily understood that if from excessive repletion of these veins from over-feeding, improper food, or from malarious influence, when the blood is driven towards the spleen, these valves, from long-continued distension of the veins, may act inadequately, or become ruptured, and the extravasation of blood into the spleen be thus produced, and this blood, unpurified by the liver, may contaminate the whole mass. The matter, at any rate, is worthy of future investigation. I regret that in my examinations I did not investigate the state of the valves, but this explanation has only recently occurred to me. To give the reader some idea of the number of these valves, let me quote the following passage from my work "On the Spleen,"<sup>1</sup> already noticed,—“In the careful examination of the splenic vein of 12 horses, I find the following result as regards the number of valves. No. 1, two pairs of valves,  $2\frac{1}{2}$  inches apart; 3, two pairs of valves and two folds of the lining membrane; 4, one valve close to the mouth of the vein, and two 4 inches beyond; 5, three pairs—two at the mouth of the vein, and two 6 inches below; 6, valve at the mouth of a large vein which enters the main trunk,



and two 3 inches below ; 7, valves at the mouths of all the large veins, and two pairs in the main trunk ; 8, valves at all the main openings, and two pairs 6 inches below the entrance ; 9, no valve in the main trunk, but one in a large branch ; 10, two valves near the mouth of the vein, and two 3 inches below ; 11, one valve near the mouth of the vein, and two 3 inches below ; 12, three pairs of valves, and one pair at the mouths of all the lateral veins." Besides these, the stomach veins are supplied with numerous valves. In the ox and sheep the valves are also very numerous, and the reader must bear in mind that splenic apoplexy *does not occur spontaneously in animals that are not furnished with these valves*. The deterioration and poisoning of the blood, I believe, is an after process. The blood that should be purified in the liver returns to the spleen.

In the human subject enlarged veins in the legs are very common, and, as I pointed out in my Jacksonian Prize Essay on the "Diseases and Injuries of the Blood-vessels" (1844), they generally have their origin, I believe, in the rupture or inefficient action of the valves, and occasionally death takes place from the rupture of a vein and the excessive loss of blood ; but the process of enlargement in the last-mentioned case is comparatively slow. Gradual enlargements of the spleen, too, in man are not unfrequent ; one instance is recorded of the spleen having attained the weight of 35 lbs. In long-continued ague, as is well known, the spleen often enlarges, forming what is called "ague-cake ;" but this enlargement generally subsides. In the Museum of the Veterinary College, there is the model of the spleen of a horse which weighed 76 lbs. ; the horse was killed at the age of 17 years, and carried his master up to the time of his death. In the "Veterinarian,"<sup>1</sup> (April 1863), Mr Perrins, of Worcester, gives the case of a hunter, 20 years of age, that carried his master (who weighed 17 stone) nearly up to the time of his death ; this horse's spleen also weighed 76 lbs. It must be remembered, however, that these were examples of gradual enlargement ; but it is not improbable, I think, that they had their origin in splenic apoplexy. Let us look, however, to the practical evidence in support of this valvular theory, and I think it will lead to useful results as regards the prevention of the disease.

M. Delafond, many years since, came to the conclusion that splenic apoplexy in France had its origin in over-feeding and excessive repletion ; that sheep that had been scantily fed, if turned into too luxuriant pasture, were very liable to the disease ; and that food containing an excess of nourishment was likely to produce it. This opinion, I believe, was shared by the majority of the veterinary profession in France.

Since the disease has been better known in this country, I have obtained a large amount of evidence from veterinary surgeons to the same effect. I will quote some of the most practical just received. Mr Tombs, of Stratford-on-Avon, says : "The cases which came under my notice were short-horned milch cows that were attacked in the autumn, the milk at that time of year being much diminished in quantity, and, as a necessary consequence, the blood that formed it is diverted to some other part of the system, probably to the spleen. In the cases above mentioned, previous to the attack, the cows were turned into a seed-field and a sound turf meadow alternately. I cannot attribute the disease to food or atmosphere, but rather to plethora, from a diminution of the secretion of milk. The remaining portion of the herd was taken to a distant farm." And Mr Tombs goes on to say, that, "by being kept without food at night, and being on poor pasture for a month, none of them had the disease."

Mr Carless, of Stafford, says : "I am of opinion that the disease was produced by plethora. I believe that it is not contagious, and that when it proves fatal to several animals at the same time, it invariably is occasioned by the food, and not from any other cause."

Mr Hutson, of Market Rasen, "believes that the primary cause of splenic apoplexy is luxuriant pasturage, which causes the animal to make too much blood. He does not think that the disease is contagious. In the cases where he



has seen it, the water was not only bad, but scanty in supply. One animal that recovered had a drink given to it composed of strong stimulants and opiates.

Mr Dickinson, of Boston, before alluded to, informs me, that his "belief is, that the most exciting cause of splenic apoplexy is over-feeding, especially when poor beasts are at once placed on the best of food, and where, perhaps, twenty oxen are placed in a crew-yard where there is hardly room for half the number. The grass-land being very poor this season, we have had," he says, "only one outbreak of this disease, and only one death." He believes the disease to be "highly contagious."

Mr Bond, of Buckingham, who has been inspector for twenty years to two Mutual Cattle Associations, the number of beasts amounting to 13,000, thinks "that it is neither contagious nor infectious, and that its cause, with that of pleuro-pneumonia, is involved in as much obscurity as ever."

Mr Taylor, of Wix, Essex, says, "that he has treated many cases at different times in spring and summer, but seldom in the winter. He thinks that Highland stots, in good condition, are the most liable to it. He thinks, moreover, that he has cured it by early bleeding."

Mr Redwood, of Dorchester, does not subscribe to the food theory, but believes it to be a zymotic, or blood-poison disease; he does not think it contagious.

Mr Dawson, of Strathdon, Scotland, remarks, "that although the disease is considered a new one in Scotland, he has known it for a great many years; he believes the cause to be solely that of plethora, arising from the system of over-feeding and forcing that is now so prevalent. He has only seen it in animals in high condition, or those becoming fat. Cattle turned into aftermath clover-leys about August and September are also subject to it. Although strange, he has observed that the first six animals attacked have generally fallen victims to the disease, and he believes it to be neither contagious nor epizootic."

The above extracts were from letters in answer to my inquiries.

2. IS IT OF MALARIOUS ORIGIN?—I believe that it more frequently occurs in marshy and malarious districts; but, on the other hand, it has made its appearance where no such poison as malaria appeared to exist; and it is a curious, and I think a convincing fact, that very lean animals on spare diet, in malarious districts, are not, so far as my inquiries have gone, subject to the disease.

3. WATER.—I believe that this has little or nothing to do with the production of the disease; indeed, a large proportion of the oxen attacked are fed in yards or sheds on succulent food, so that no water is required. And it is notorious that cattle give the preference to the most impure water, and drink it with impunity.

4. ILL-DRAINED YARDS AND BADLY-VENTILATED SHEDS may favour its increase when the exciting cause is present, but I believe that splenic apoplexy is never occasioned by these causes alone.

5. IS THE DISEASE CONTAGIOUS?—This is a very important question, and I have paid a good deal of attention to it; but I fail to discover any satisfactory evidence of its contagious nature in this country. That the disease may be communicated by inoculation I showed in 1852; and additional evidence has been afforded by Dr Maunoury in France that it may by this means be transmitted from horse to sheep, and from sheep to horse. The cases that occur in England are generally isolated, or the disease may break out on two or three neighbouring farms; and, as I have said before, we have no examples of its extensive fatality among sheep as in France and in other countries. A long controversy has taken place between two French veterinary surgeons, published in the "*Recueil de Méd. Vétérinaire*," 1862. Messrs Garreau and Moisant, and the Veterinary Association d'Eure et Loire, headed by M. Garreau, came to the conclusion, but, as I believe, upon insufficient evidence, that the disease is contagious. If animals are sent to a farm where this malady has prevailed, they are exposed to the same exciting causes probably, and hence they are likely to take the disease.

M. Moisant has, moreover, shown, that at the market of Brou—where there are often 10,000 sheep, many of which are driven from La Beauce, where the disease



is so prevalent, and where several are left on the road from fatigue—if this disease were contagious, scarcely a sheep, ox, or horse would be free from it (“Rec. Vét.,” 1861, p. 905).

I believe there are but very few, if any, veterinary surgeons of this country who will subscribe to the doctrine of contagion. All, with one exception, who have kindly replied to my inquiries, think that the disease is non-contagious.

6. IS THE FLESH OF ANIMALS AFFECTED WITH SPLENIC APOPLEXY INJURIOUS TO THOSE WHO EAT IT?—The evidence I have adduced respecting the death of many animals from eating the uncooked flesh, blood, and viscera of oxen dying of this disease, would be, perhaps, sufficient to convince some persons of its injurious effects upon man. M. Garreau (before quoted) calls it a volatile poison, and, judging from inoculation, he found that it lost its virulence after a certain time of exposure.

I cannot procure any reliable evidence to show that the cooked flesh is injurious, but it must be remembered that most of the animals that die of this disease are sent to London, or to some large town, and the meat distributed in various directions, so that it is almost impossible to ascertain its effects. My belief is, that when cooked it may be eaten with impunity. I hope, however, to ascertain this by a series of experiments that I purpose undertaking as soon as I can obtain the bodies of animals dying of this affection.

7. DO FUNGOID OR CONFEROID GROWTHS TAKEN WITH THE FOOD OCCASION A KIND OF FERMENTOUS POISONING OF THE BLOOD?—In estimating the effect of a poison, we know, with tolerable certainty, that poisons produce given symptoms in the same, or even in different species of animals. If a sheep, a horse, or an ox, for example, takes a certain quantity of upright-crowfoot, or water-crowfoot (*Ranunculus acris*, *R. sceleratus*)—the former plant abundant in some of the pastures where animals have died of splenic apoplexy—there is irritation and redness of the inner lining of the stomach, with other symptoms of irritant poisoning; but, although two other species of ranunculus (*flamula* and *arvensis*) are said to have killed many sheep in the spring, I believe that poisoning from this cause is very unfrequent in this country. Castor-oil seeds, from which the ordinary oil is expressed, are very poisonous, as has been recently shown by animals that have been poisoned by inferior oilcake. Besides these, poisonous plants, such as hemlock, yew, hellebore, meadow saffron, laurel, and several others that might be named, sometimes occasion the death of our grazing animals; but in none of these cases of poisoning are the symptoms and morbid appearances similar to those in splenic apoplexy. I mention this because a large number of animals that have died of this disease were supposed to have been poisoned. Some of the poisonous fungi produce symptoms, perhaps, more nearly allied to those observed in splenic apoplexy; and it has occurred to me that some unknown parasitic fungus might occasion the disease, but I have failed to detect this in my examinations. The Rev. E. Sidney, in his paper on Parasitic Fungi, “Journal of the Royal Agricultural Society,” 1849, in speaking of a fungus (*Ustilago hypodytes*) very common on grass, says, “I will only remark, that it is more common than is supposed; and I am persuaded that cattle in ill-drained localities, where it always abounds, derive serious injuries from it, and that it is the unsuspected cause of many disorders both in oxen and human beings.”

Since the above was written, I have met with the account of a recent discovery, or supposed discovery, by M. Davaine, the zoologist, respecting the cause of splenic apoplexy, in a communication made to the Academy of Sciences, Paris (“Gazette des Hospitaux,” Hospital Gazette, Paris, Aug. 4, 1863). In six animals that died of this disease, M. Davaine found *bacteria* in the blood; he describes them as very minute, filiform, immoveable bodies, that resemble vibrios. He did not find them in the blood of healthy sheep, and they disappear after the putrefactive process commences. In inoculated rabbits they were not present after twenty-four hours, but after fifty or sixty hours, or a short time before death, they were abundant. I have seen these bodies, or bodies resembling them, in the blood of animals dying of splenic apoplexy, and, I believe, of other diseases, but



I have taken them for crystals. I may have been deceived, but I think not. The subject, however, is well worthy of future inquiry.

TREATMENT.—It is evident, as I have before said, that in the malignant form of the disease treatment can be of little avail, and the sooner the animal is slaughtered the better. The mischief is done before the veterinary surgeon has an opportunity of applying his remedies : much, however, may be accomplished, I think, by preventive measures, such as removal from the locality, the diminution in the quantity of the food, as well as a change in its quality. In the animals that I have recently described (page 45), those that were unaffected took at my suggestion salt and sulphur as prophylactics, and the more valuable animals took 60-grain doses of quinine : none of them had the disease after this treatment ; but a large number of cases will be required to test its efficacy. My impression is, in all cases, that alterative medicines, such as sulphur and oil of turpentine, should be given to the animals that are apparently well ; and, assuming that the disease may have a malarious origin, the quinine is likely to be serviceable. I speak with less hesitation than I should do if we had more extensive records of the treatment of the disease.

One important and interesting question is THE PROPRIETY OF BLEEDING ? In the malignant form, some believe that life has been prolonged by it ; but there are many modern practitioners (excluding the homœopaths), whose horror at the loss of blood in man or brute is so great, that they would at once condemn the practice, and would scarcely believe that an animal could recover that had been subjected to this mode of treatment. “ Blood,” they say, “ is life, and the abstraction of the vital fluid must diminish power.” A more absurd and unphilosophical conclusion I believe could scarcely be arrived at. Bleeding, in some instances, as I have not unfrequently witnessed, so far from diminishing power, gives energy to the system by unloading the oppressed heart, the congested lung, or the overcharged brain ; and I am at a loss to understand how the abstraction of a certain amount of vitiated or poisonous blood can be injurious or debilitating. I may at once express my belief, that if any mode of treatment is likely to save life in the malignant form of the disease, the abstraction of blood from the diseased animal and the transfusion of blood from a healthy animal into its veins, will be the most efficient means : but such a plan would only be justifiable in the case of very rare and valuable animals. I may here mention what I have long publicly predicted, that the next important change in the treatment of many diseases in man and brutes will be abstraction of blood and the administration of stimulants at the same time. The two modes of treatment in my estimation are quite compatible, although to many they may appear to be inconsistent.

Many animals have been bled in the malignant form of the disease, and some suppose that life has been prolonged by this means. It is worthy of notice that in the outbreak in Northumberland, elsewhere mentioned, the animals died much sooner when left quiet, and that none that were sent away died in the railway truck.

Let us inquire what effect bleeding has had as a preventive ? In the cases I have lately seen, fifteen of the unaffected animals were bled by the veterinary surgeon in attendance. Of these, two were attacked, and both died. In the cases already alluded to by Mr Howell (page 42), all the twenty-nine cows on the farm were bled August 12, after the death of seven, and each had a dose of sulphur, nitre, and Epsom salts : only one of these died, two days after the bleeding. Mr Dickinson (Cases, page 42) bled from two to four quarts, and of thirty animals subjected to this treatment all recovered. In the report by Professor Simonds (page 204), it is stated that on Mr Bradley’s farm, on the 11th of May, four cows were found dead ; the remaining fifteen were bled, and aperient medicine was given : one died on the same day, four on the following day, and four on the third day ; the others recovered. But it is evident, I think, that these animals had extravasation into the spleen and vitiated blood before they were bled ; for I have reason to believe, that although the alarming symptoms may manifest themselves only a short time before death, and there is a slow and deteriorating change



going on in the blood for some time previous to dissolution, and probably when this is the case, every mode of treatment that we are at present acquainted with will be ineffectual.

#### CONCLUSIONS.

1. That splenic apoplexy in this country occurs more frequently in marshy and malarious districts, and is more common among animals that are over-fed, especially when they have had previously a comparatively spare diet.

2. That it more frequently occurs among oxen that are highly fed in yards or sheds, or among those in tart and luxurious pastures, and that it attacks the most vigorous and well-conditioned animals.

3. That it may make its appearance at any period of the year ; but that out of 244 cases that I have collected, 179 of them occurred between June and December, and 65 between January and May—the greater proportion being in July and August.

4. That a vast number of animals—oxen, sheep, and horses—are annually lost in this country from splenic apoplexy, although the disease is not generally attributed to this cause.

5. That taking all the evidence into account that I have obtained respecting the cause of this disease, I have reason to believe that the quality and quantity of the food have much to do with its production.

6. That the great and sudden repletion of the veins, occasioned by over-feeding or by malarious influence, may produce rupture or derangement of the mechanism of the valves (spoken of at pp. 47, 48), and in this way the extravasation of blood into the spleen, and its subsequent deterioration, be produced.

7. That splenic apoplexy does not occur spontaneously in animals that are not furnished with these valves.

8. That the fresh blood, viscera, and flesh of animals dying of this disease, are often poisonous and fatal to animals that eat them.

9. That the viscera and offal of all animals affected with this disease should be removed, and buried or burnt immediately after death.

10. That great care should be taken by those who flay or dress the bodies of animals that die of splenic apoplexy, to prevent cuts or punctures on their hands and other parts.

11. That there is no recorded evidence in this country to show that this disease is transmissible from one animal to another ; but as this question is yet undetermined, it is important on all occasions to keep the affected animals as much isolated as possible.

12. That proof is wanting that the cooked flesh of oxen or sheep that are slaughtered when affected with this malady, is injurious when used for human food.

13. That the prompt and early attendance of a veterinary surgeon is especially called for in this affection.

14. That when the disease has made its appearance among oxen that are highly fed, the diminution of the quantity of the food of the unaffected animals, and the administration of sulphur or of oil of turpentine in small doses, or of quinine in doses of 60 grains, under the superintendence of a veterinary surgeon, may act as prophylactics or preventives.

15. That removal to a different locality, as well as change of food, is in all cases desirable.

16. That notwithstanding the evidence adduced, there is much obscurity about the cause of the disease, and that a series of well-conducted microscopical and chemical analyses of the blood and urine of animals affected are necessary before accurate deductions can be arrived at.



## THE REQUIREMENTS FOR THE PROPER STUDY OF MEDICINE,

BEING THE INTRODUCTORY ADDRESS DELIVERED AT THE OPENING OF THE MEDICAL SCHOOL, FOR THE SESSION 1863-64, BY J. WARBURTON BEGBIE, M.D.

*(From the Edinburgh Medical Journal, December 1863.)*

GENTLEMEN,—Different as the individual circumstances may be in which you are placed, your presence in this hall, and at this time, entitles me to consider the great majority of my hearers as similarly situated in one most important particular—you are Students of Medicine. The period of your studies is no doubt various ; to some whom I now address, this class-room is a familiar object, others find themselves here to-day for the first time. Having, however, embraced Medicine as the profession of your choice, you are in this respect at one : it is a similar object which attracts you here.

Let me, then, in fulfilment of the duty I have this day undertaken, invite your attention to the characteristics and advantages which should be possessed by those who would study medicine aright ; and in doing so, to some few particulars in connection with the history of the profession, which cannot, I think, fail to be of interest to you who have either lately begun, or are now about to commence, your career as students. It were no uninteresting task to inquire what are the circumstances which lead to the adoption of a particular profession by different individuals ? and the interest of such inquiry would be heightened by noticing the causes which in special cases have appeared to contribute to subsequent success or failure. That in many instances the original choice of a profession, if not wholly fortuitous, is at all events largely determined by some accidental circumstance, does not admit of doubt. Not unfrequently the person chiefly interested has very little indeed to say in the selection ; it is made for him, and not by him. We have, however, the satisfaction of knowing that some for whom the profession of medicine has been thus chosen have risen to deserved eminence, and, indeed, to pre-eminence in it. There is the best authority for our giving credit to the ordinarily received statement regarding the renowned Greek physician Galen, whose voluminous works have exerted as important an influence on the progress of medical science as those of any author in ancient or modern times. It was by the mere accident of a dream that Nicon, his father, was led to change the destined pursuit of Galen's life from philosophy to medicine. Thus fortuitously was secured for our profession one of the greatest names of which we have to boast. At an earlier period by some hundreds of years than that when Galen flourished, the profession of medicine was, as a general rule, transmitted from father to son. This was the case in the family of the most illustrious by far of the Greek physicians—Hippocrates. Heraclides his father, Thessalus and Dracon his sons, as well as Polybus his son-in-law, were all physicians ; and not only so, but, as is familiar to us also in modern times, the profession in that family continued to descend in the direct hereditary line for several successive generations. But whether spontaneously embraced or fortuitously chosen, there can be no question that, in order to attain eminence, or what is of more consequence, to achieve usefulness in such a profession as medicine, certain distinctive qualities are essentially requisite in the individual, and ought to be possessed by all those who are endeavouring to prepare themselves for its exercise. Evidently deeply impressed with the gravity of medicine as a profession, and the responsibility connected with its choice, the author of one of the works in the Hippocratic collection, known as ΝΟΜΟΣ, Lex, the Law, not unreasonably supposed by some to have been the Father of Medicine himself, has in admirable language indicated what those advantages are which the individual anxious to arrive at a true or thorough knowledge of medicine should possess. “ He who would acquire an intimate acquaintance with medicine must have a natural disposition, instruction with a favourable position for its reception, early tuition, love of labour, and



leisure or time to devote to the study.”<sup>1</sup> Let me ask your attention to these particulars a little in detail, and the import of certain of the terms employed will be found well worthy of notice. At the outset, then, it is held essential for the acquirement of a satisfactory knowledge of medicine, that the individual should be possessed of a natural disposition towards it. The Greek word φύσις, thus rendered, also signifies natural ability, and implies, just as the Latin *Natura*, by which it is expressed, inborn taste, a natural bent or inclination. Who can doubt the truth of this assertion? If it be the generally received opinion in regard to all professions, that the highest success cannot possibly be attained without a hearty devotion to them, very specially may this be affirmed of medicine. It is true of the study of medicine, and likewise of its practice as a profession. Granted that many, indeed all of the subjects of study included in a medical curriculum, are in themselves most interesting, and such as in not a few instances completely absorb the attention of the students, still it must be admitted that the existence of the natural disposition, the φύσις, is really necessary in order that the fundamental knowledge be attained. Anatomy, without the taste for its study, will soon cease to be interesting. Acquaintance with the bones will not have been made before the student is wearied, and quite ready to abandon its pursuit for that of something else, which to him is κατὰ φύσιν—that is, naturally much more agreeable. The same remark holds true of chemistry, of botany, of physiology, in fact of all the different branches of medical knowledge. Unless possessed of a natural inclination or bent towards their study, it will be miserably forced work at best, and in the end the individual who has thus attempted to master them will find that the sum of his knowledge is very small indeed. The taste for the study which is thus referred to is spoken of as inborn, natural to the individual; but it were a great mistake to suppose, that although indigenous, it may not be greatly improved, largely increased, and strengthened by cultivation. Thus, indeed, may an inclination for the study of any one of the branches of knowledge already named, or of others included in the professional education you have to follow, which at the first has existed in only a limited degree, become quickened; and possibly, lest it prove too absorbing in its demands, may at length require to be rather checked than encouraged. True of the study of medicine, what has been said holds good likewise of the practice of medicine in its highest aspect, and although many of you are only now on the threshold of the former, you cannot be too early casting your vision forward to the latter. In the practice of medicine, as an ennobling profession, there must be the φύσις. Without the natural disposition with the fruits it yields, what is there either to stimulate or to encourage? Ours assuredly is not a calling which the man ambitious of acquiring wealth or even great worldly distinction should embrace; the honours and rewards medicine holds out are not such as usually offer any temptation to those who seek these for their own sake; besides the arduous nature of it, itself repels many who might otherwise feel some attraction towards it. Nevertheless, it may without hesitation be affirmed, that the profession of medicine, properly discharged, affords as much real happiness to its cultivators as any other, it being always held in remembrance that the enjoyment of such happiness as is here referred to is only consistent with the being personally deserving of it. “Est demum vera felicitas, felicitate dignum videri.” Be very jealous, gentlemen in the way you watch, and very careful in fostering this natural taste for medicine which I shall assume you all possess. Do not, I beseech you, now that you are fairly entered on your professional studies, trifle with it; let no pursuit or pleasure, however innocent in itself, usurp the place in your esteem which of right now belongs to it. As you advance, the natural taste will increase, till at length it is found to have reached such goodly proportions that there need no longer be any fears entertained regarding your steadfast devotion to your profession.

<sup>1</sup> Χρὴ γὰρ ὅστις μέλλει ἱππικῆς ζύνειν ἀτρεκέως ἀρμόζεσθαι πᾶνδὲ μὲν ἐπήβολον γενέσθαι φύσιος· διδασκαλίας· τόπου εὐφύεος· παιδομαλίας· φιλοπονίας· χρόνου. Hippocratis et Aliorum Medicorum Veterum Reliquiæ. Edidit F. L. Ermerins.



I have already remarked that the Greek word rendered natural disposition, signifies likewise natural ability, while it is very probable that, in the passage of the Law already quoted, it was designed to have specially this latter signification. Thus considered, I would only further remark, that the expression directly points to the responsibility there must always exist in the selection of a profession. There may be in an individual the natural ability, but not of that kind which is requisite for the proper study or practice of such a profession as medicine, and the duty is, no doubt incumbent upon those chiefly interested, to determine as far as possible whether the ability as well as disposition or taste is in existence. Looking back upon my own somewhat limited experience, I am compelled to admit that I have known some students of medicine who possessed neither the natural ability nor the taste requisite in order to insure a useful, and therefore happy career ; and some, again, who, having perhaps the taste in an inferior degree, wholly lacked the ability. By a few of those to whom I now refer, the discovery of this very serious want was made in due time. Medicine by one who certainly had not the natural ability for its thorough prosecution, was abandoned, and happiness secured in the more congenial position of a military officer ; while another, who only lacked the taste, presently adorns the pulpit. It were well that all who had made such discovery for themselves had thus acted ; the profession, it must be confessed, contains not a few of whom it is to be regretted that they had not earlier learned the Hippocratic lesson, "When Nature opposes, everything else is vain."

Being assured of the possession of the natural disposition, the student seeks instruction. *Διδασκαλία*, Doctrina, the knowledge imparted by teaching, and this he endeavours to obtain in a position favourable for its acquirement. *Τόπος ἐὺφύης*—Locus studiis aptus. You see, in the advantage or acquirement thus specified, how modern practice largely conforms to ancient usage ; but there is a remarkable variance, for whereas, in the early cultivation of medicine among the Greeks, and for ages thereafter, everything may be said to have depended on the teaching properly so-called of the art, the facilities afforded for private study in modern times, chiefly through the dissemination of learning by means of books, has placed the instruction or training by teachers in a less commanding, though it still occupies, and will continue to do so, a very conspicuous place. What the student of every science will do well always to hold in remembrance is, that as far as he personally is concerned, the teaching of it is of secondary importance to the study. Properly speaking, he is only to be assisted by his teachers in the acquirement of the necessary knowledge ; it is through his own exertions and well-directed efforts that the student of medicine is to become thoroughly equipped for the profession or calling to which his after-life is to be devoted. We, however, as teachers, feel fully entitled to say, that here you are offered as students a favourable position for the study of medicine. I speak of this position not in a narrowed or restricted, but in the fullest possible sense ; not as the Extra-Academical or the University Medical School, but as both together, for it is in their union that Edinburgh is to be regarded in respect of instruction in medicine as "locus studiis aptus." We have the favourable position illustrated in its possession of our noble hospital, in which the clinical study of diseases can be efficiently carried on—in its laboratories for the furtherance of chemical inquiry—in its dissecting-rooms for the acquirement of anatomical knowledge—in its libraries ; and, if I now mention such last, they are not in my opinion of least value, the admirable students' associations known as the Royal Medical and Hunterian Societies. On only one particular shall I claim the privilege of being a little more personal. We, as teachers, welcome back this day to our number the colleague who is to preside over the department of anatomy under this roof. In doing so, there are some of us, myself among the number, who cannot fail to call to remembrance that exactly twenty years ago we took our seats for the first time as students of medicine under his guidance and that of another teacher whose highly valued connection with this school continues, and must, we feel sure, greatly enhance the gratification Dr



Handyside now experiences. Twenty years have wrought many changes, but none in the feelings of regard and respect we entertain for our former teacher and constant friend. Yes, twenty years have wrought many changes. I call this day likewise to remembrance those who, commencing their studies at the same time and under the same happy auspices, never brought them to a close; and others who, whether in the service of their country, of whom there have been several, or in the discharge of their professional duties in scenes of more than ordinary trial and severity, "have sunk untimely from the light of life into the darkness where there is neither work, nor device, nor knowledge."

"Claudite jam, Parcæ, nimium reserata sepulcra;  
Claudite: plus justo jam domas ista patet."

Having mentioned the necessary existence of an inborn taste, and the advantages connected with instruction, and a favourable position for the study of medicine, the author to whose important statement I have been directing your attention next insists on the value of early tuition, learning in childhood—*Παιδομαθία*, *Institutio a puero*. The precise meaning of this expression is not difficult to determine, when taken in connection with a remarkable passage in the Republic of Plato. The divine philosopher, though not a physician, had devoted himself to the study of medicine, and has expressed the opinion that those are the best physicians who early in life apply themselves to it, and as much as possible familiarise themselves with diseases. Allusion has already been made to the circumstance of the profession being to a large extent hereditary in the time of Hippocrates. Born probably, and certainly reared, in one or other of the then famous Temples of Health, the youthful aspirant after medical knowledge must, from a very early period of life, have been brought in contact with maladies and become conversant with the means then adopted for their cure. But while all this is no doubt true of the education of the early Greek physicians, and specially so of Hippocrates, and while its value as a plan or system of professional education cannot be gainsaid, it is well worthy of notice that, besides enjoying an extended course of medical study, they devoted themselves to the acquirement of a knowledge of the polite literature, and of the philosophy, of the age in which they lived. An education solely professional, gentlemen, is not to be desired; rather has Galen expressed the desideratum when he says that every physician should be acquainted with something else than, or in addition to, physic. It might, perhaps, speciously be argued that such advice was no doubt very applicable to the cultivators of medicine in the second century, when the renowned physician of Pergamum himself flourished, for then an acquaintance with the whole theory and practice of medicine was far from difficult of attainment; but that now, when the boundaries of medicine have so exceedingly advanced, and may truly be said to enclose various more or less intimately correlated sciences, the student as well as the physician may be excused if they be ignorant of much, the knowledge of which is, however, expected in every well-educated gentleman. The day, I trust, is very far distant when such a view as this will become commonly adopted by or widely diffused among those who, in virtue of their peculiar position in the governing body of the profession, or in the councils of its colleges, have it in their power very easily and speedily to deprive medicine of that character as a liberal profession which happily it still enjoys, and which for many years it deserved in a measure superior perhaps to all rivals. The preliminary studies in which the student of medicine is required to engage, and more especially the cultivation of the dead languages, have, according to universally entertained opinion, a most powerful influence in quickening the intellect, in expanding the understanding, in preparing the mind for the fuller enjoyment and higher appreciation of those exercises in which it is to be engaged when the strictly professional studies are in progress. This, undoubtedly, is the main reason why such occupation as the study of Latin and Greek and the cultivation of mathematics and the philosophies gives to the mind, will prove useful to him who has chosen medicine or other liberal calling as his profession. Another reason as respects the former of



these pursuits, although of secondary importance, should not be overlooked. The student of medicine, however highly or previously imperfectly educated he be, will be required to form acquaintance with, and store in his mind, a whole host of new words,—a new language, in short, which the necessities of the science have created. Aided by a previous competent knowledge of Latin and Greek, from which the terms in question are in great part derived, they will be with infinite readiness acquired, and with a like facility retained. Very different, however, will it be with him who has devoted little or no attention to these languages. His labour in the acquirement and retention of such terms will be amazingly increased, and from ignorance of their true and full meaning, the hold his memory has of them will never be trustworthy. So much in favour of an extended preliminary education, and the advantages which the more liberal study of medicine secures. This acknowledgment by no means prevents, or strictly speaking, opposes me in urging, as I now do, the value of the advice which the Hippocratic Law contains, and which Plato adopts. Early instruction in medicine is, I believe, of the highest importance. Little need, however, is there for Latin and Greek being cast aside when the young student enters for the first time on his professional studies. I can see no possible incongruity between devotion to anatomy and the retention of all the fervour for classical pursuits which you may have hitherto entertained. Equally with your favourite authors may Hippocrates and Celsus now, however, claim your attention. The Latin of the latter is as good as his surgery, and that is saying all that can be said for both. A great modern surgeon has indeed earnestly advised students to keep the works of Celsus in their hands both by day and by night ; and with justice has the renowned author of the treatise, “*De Medicina libri octo*,” been familiarly described and long known as “*Hippocrates Latinorum et Medicorum Cicero*.” Yes ; I believe the advice to be sound—the advantage to be real—early instruction in the art to be desirable. Come to its study, gentlemen, with young hearts and earnest minds. Medicine deserves, and will most bountifully reward, the devotion of both. No better mental training can be found anywhere than in the study of anatomy and chemistry ; and these are the subjects to which you have first of all seriously to settle. But however diligently you may be devoting your time to both, you need not be prevented spending a limited portion of your day in the hospital,—in the observation of patients at the first, perhaps, more than in the observation of diseases. I am convinced that there is no occasion for the student delaying till near, oftentimes very near, the termination of his whole curriculum the clinical portion of his studies. For the latter to prove really valuable, it is no doubt necessary that some advance in the acquirement of anatomical and physiological knowledge has been made, and the more accomplished anatomists and physiologists you are, so much the better surgeons and physicians will you become. But while yet the rudiments of these sciences are being apprehended, the student can be learning—yes, and learning without any mental strain—much of what is to be of highest value to him in his future career. A distinguished living teacher of medicine has expressed himself strongly and eloquently upon this head. “*From the day*,” says M. Trousseau, “*that a young man intends to become a doctor, he should frequent the hospital ; he should see, be always seeing, patients. The confused materials which he thus amasses without order or method, are nevertheless excellent materials : useless to-day, they are long hence to be recovered in the treasures of memory. Now, when I am old, I can remember the patients whom I saw forty years ago, as I made the first steps in my career. I call to remembrance the chief symptoms, the lesions of structure, the numbers of the beds, and sometimes even the names of the patients, which, at a period so distant, made a powerful impression on my mind. These recollections are still serviceable to me,—they still instruct me. In our intercourse at the bedside you will sometimes hear me recall them.*”<sup>1</sup> Such, too, may be your experience, gentlemen : and in this way will the charm which the study of medicine creates—

<sup>1</sup> Clinique Médicale de l’Hotel-Dieu de Paris.—*Introduction*.



a charm so incomprehensible to the uninitiated—be earliest invoked. I have no fear of your returning with lessened pleasure to the dissecting table, or with diminished aptitude for its investigation to the chemical problem in the laboratory. On the contrary, your daily brief visit to medical or surgical wards, while teaching you something of the physiognomy of disease, will satisfy you how necessary a knowledge of anatomy and chemistry is to the surgeon and physician, and therefore with renewed interest will you take up the scalpel and handle the blow-pipe. Yes, gentlemen ; and in another sense—I will not call it a higher, but a very high sense—these early visits to the hospital will be useful to you. You cannot be too forward in seeking that moral training which is requisite for us all. This, again, may not be better obtained than in the immediate sight of the suffering objects of our care. Go, then, at once to the bedside, and witness disease. Go while your hearts are yet tender with home thoughts and memories. The instruction, silent though it be, which you there receive, will take a deep root, and fasten a sure hold.

“ Nunc adhibe puro pectore verba.”

Again, the Hippocratic writer insists on the student possessing a love of labour, patient industry, diligence, φιλοπονία, Industria. This qualification is assuredly necessary for success. The natural ability without it will not suffice. Not unfrequently we find those who, possessing excellent, it may be even very distinguished talents, want the love of labour, the patient industry of which I now speak ; and the end of such students is almost certainly disastrous. To insure success and happiness, be instant in your application, and be constant. So apportion your time that the period devoted to study is observed with the same regularity as the hour which calls you to classes or to meals. Fix it in your own minds that nothing is to be allowed to interfere with the devotion of a certain time to reading and to reflection. By acting in this way, and thus securing a decided advance in knowledge day by day, you will obviate the necessity for that forced and almost incessant application, determined by the near prospect of an examination, which is found to be so injurious both to mind and body. While leading the life of a student, do not think it incumbent upon you to neglect the care of the body. Take, if possible, a daily quantum of exercise ; and, at all events, secure to yourselves the Saturday half-holiday, which has become, and properly become, the possession of nearly all working men. I know no working men who better deserve, or more urgently require, the recreation thus afforded than medical students. Without entering on the vexed question—ably discussed, but left wholly unsettled, in the recent Social Science Congress—as to whether bad smells are inimical to human health or not, I am thoroughly satisfied that the student who spends several hours daily during the week in the atmosphere of the dissecting-room, can only maintain his bodily vigour intact by availing himself of the short country excursion which the Saturdays afford. On that day, also, and for the same reason, I am disposed to make the hospital visit briefer, so that the student who has been diligent in his attendance during the whole week, may not, like the poet, be found sighing merely for the country—

“ Oh ! when again  
Shall I behold the rural plain ? ”

but regularly taking advantage of the unequalled facilities for reaching it which this city offers.

And now there only remains for us to notice the last of those advantages of which the learned author has made mention, to-wit, time or leisure for the study—Χρόνος, Tempus. Compare this with the expression found in the universally admired exordium of the book of Aphorisms, “ Life is short, and the art long.” Here the brevity of the human existence is contrasted with the extent of the medical art. And yet, although life be short, there must, for the acquirement of a thorough knowledge of medicine, of necessity be the time to devote to its study. It is not in modern days alone that persons have been found possessing the



temerity and impertinence to profess and practice the art of healing without having enjoyed the benefit of an extended medical education. Hippocrates bitterly complains of such. "Medicine," he remarks, "is of all arts the most noble, but owing to the ignorance of those who practise it, and of those who with little discernment form a judgment of them, it is at present far behind the other arts." And, again, Galen in his time, loudly and indignantly reproaches a certain Thessalus, styling him "*ille impudentissimus Thessalus*," who had proposed to limit the study of medicine to a curriculum of six months. You may rely upon it, gentlemen, that the period ordinarily prescribed by the statutes of universities and colleges for the study of the profession is not unnecessarily lengthened, but, on the contrary, demands a rigid economy at your hands, in order that a satisfactory acquaintance may, while it lasts, be made with the numerous branches of knowledge which medicine embraces. In the earliest Christian university, that of Salerno, in Italy, which, as a school of medicine, reached its highest eminence in the twelfth and thirteenth centuries, the requirements in this respect were more extended than those which now exist, for no candidate could be admitted to public examination who was unable to afford full proof of his having diligently studied during a period of seven years. I do not, however, wish you to imagine that, in my opinion, the period of study presently required is, on the other hand, too brief. It is sufficient if turned to proper account, to enable the student to acquire a satisfactory knowledge of the early or preliminary branches; and of the more strictly professional branches, we are not to be students for four or seven years, but for life. Thus, and thus only, shall we be entitled to be esteemed "physicians not in name merely, but in reality and in effect."

These, then, are the advantages which it is incumbent upon you as students of medicine to possess—a natural disposition, instruction, a favourable position for the study, early tuition, love of labour, and time to devote to the study. None of these are of really difficult attainment; and thus furnished, no one need feel distrustful of success.

Your labours in this or other seats of medical instruction being over, you will be admitted to a place in a profession which has in all ages been regarded as most useful and most honourable. I know nothing more satisfactory, nothing more cheering and encouraging, in the practice of a calling such as ours, than the reflection that throughout its whole history there have never been wanting physicians who were among the very foremost men of the day in which they lived. There probably never existed a more exalted character than the Father of Medicine himself. The judgment passed upon him by a very competent authority does not transcend his deserts:—"Hippocrates qui tam fallere quam falli nescit." If he did fall into error he was ready to confess it; and in this, as in other respects, has left on record an example for our instruction. The little opportunity afforded him for dissection caused him to mistake the cranial sutures for fractures. It was the confession of his error by Hippocrates which led Celsus, in a most eloquent passage, to express the admiration he entertained for his character:—"A suturis se deceptum esse, Hippocrates memoriæ prodidit; more scilicet magnorum virorum et fiduciam magnarum rerum habentium. For," continues Celsus, "little minds possessed of nothing suffer nothing to be lost: an ingenuous confession of error is expected of a great genius, who has enough, and more than sufficient, to ensure for him esteem; and very specially is such confession commendable in the practice of a useful art like medicine, which is handed down to posterity for their benefit, that they may not be deceived in the same way as another before them has been. Regard for the memory of a great professor," concludes Celsus, "has led me into this digression."<sup>1</sup> We scarcely know whether most to admire the spirit which prompted the illustrious Roman author thus to laud the magnanimous action of the Father of Medicine, or the excellence of the advice which he makes the relation of the circumstance to convey. On one point, Gentlemen, you may rest assured, that the more you study the character

<sup>1</sup> Celsus, lib. viii. caput iv., De calvaria fracta.



of Hippocrates, as unfolded in his writings, the more will you feel disposed to agree with the testimony of the learned Macrobius,—in a tract much studied in the middle ages, and which I have already quoted,—that he knew not how to deceive or to be deceived. Equally satisfactory is it to us to find it recorded of Diocles, whom Celsus notices along with such eminent men as Praxagoras and Chrysippus, Herophilus, and Erasistratus, that he honourably practised the healing art ; or, as Galen has elsewhere put it, “*haud lucri cupiditate emolumentorumque desiderio.*” Yes, gentlemen, by the founders of our noble profession its true aims and legitimate objects were clearly recognised, and have been distinctly set forth. Should not their opinions and conduct exercise a salutary influence on us their descendants ? We have indeed every incentive of this kind to the earnest and honourable discharge of our responsible duties. If you consult the roll of that body of distinguished men in the profession, of which we have so much reason to be proud,—I mean the Royal College of Physicians of London,<sup>1</sup>—from the period of its foundation by Henry the Eighth, in 1518, at the instance of the illustrious Thomas Linacre, down to this day, when Dr Thomas Watson fills so worthily its chair,—you will, I am sure, be forcibly struck by observing how very frequently scholarly attainments, extended professional knowledge, and true nobility of character, have blended in the persons of England’s foremost physicians. Let us cherish the hope that a profession thus adorned will receive no tarnish in our day, but with its roots visited and strengthened, and itself thereby exalted in reputation and dignity, we may be able to transmit it to our successors.<sup>2</sup>

### THE FOOT-AND-MOUTH DISEASE IN CATTLE.

(From the Daily News.)

IT is time that the general public, as well as the agricultural body, should know some of the reasons why meat is so dear, and something about the state which the live-stock of the country is in. The subject of the prevalent disease in cattle is not an agreeable one, but it has become so very serious that it must be attended to. In plain words, the “foot-and-mouth disease,” which alarmed and disgusted us so much two years since, is now spreading as fast as it can be propagated by contagion. It is, it appears, a foot-disease, and the cattle themselves communicate it to their mouths. Then, by their breath, by any contact, and especially by treading the same litter in the yard and the same grass in the field, the diseased animals infect the sound, till, where the malady has once entered, there are no healthy cattle but such as are stall-fed or otherwise secluded. This is bad enough, but it is not all. Wherever the disease was prevalent on the former occasion a dreadful mouth-and-throat disease appeared among human subjects, and especially among children, as the chief consumers of milk. There was a natural disinclination to believe in this explanation of the peculiar ailment of the time till the case of the pigs seemed to decide the question. The more the milk was refused by the usual customers the more was given to the pigs, and the pigs suffered in their turn.

There should now be such a demand made for right measures as could not be refused ; and we are not aware that there are any disputes about what the right

<sup>1</sup> Roll of the Royal College of Physicians of London, by Dr Munk. 2 vols.

<sup>2</sup> “I hold every man,” says Lord Bacon, “a debtor to his profession, from the which, as men of course do seek to receive countenance and profit, so ought they of duty to endeavour themselves, by way of amends, to be a help and ornament thereunto. This is performed in some degree by the honest and liberal practice of a profession when men shall carry a respect not to descend into any course that is corrupt and unworthy thereof, and preserve themselves from the abuses wherewith the same profession is noted to be infected ; but much more is this performed if a man be able to visit and strengthen the roots and foundation of the science itself, thereby not only gracing it in reputation and dignity, but also amplifying it in profession and substance.”



measures are. Where the disease has obtained a hold, and wherever a single case is known to exist, there must be a careful and complete separation of the ailing beasts, and a cleansing or destruction of everything they have touched. We saw in the recent instance of small-pox in sheep what may be done by energy, public spirit, good sense, and unanimity in stopping a fearful plague while it was yet time. The present epidemic is of a less fatal character; but the loss, inconvenience, danger, and disgust, that it occasions are quite enough to justify any insistance on proper measures.

We are told by veterinary authorities that there is great carelessness in the admittance of foreign cattle, and in their treatment after arrival. The present state of the cattle in many European countries seems to be almost as bad as that of Egypt. There is always a dread everywhere of Prussian cattle, and the disease they carry about with them. The loss sustained by Austria within fourteen years from that quarter was, in spite of the best precautionary system known, no less than 270,000 head of cattle by death, while nearly double the number were sick. The loss in the United Kingdom by lung-disease, imported a few years ago, was much greater than even this; and it is calculated that the admission of disease with live stock has more than neutralised the benefit of free trade in that department of food, and that meat would now be less dear than it actually is if we had been precluded from getting foreign stock, and at the same time safe from their diseases. However this may be, the first practical question is whether the inspection on landing is conducted as it ought to be. Our veterinary teachers say that it certainly is not; and one case of recent date which they cite may well create great anxiety. It appears that a cargo of live stock was landed at Harwich in the middle of the night—stress of weather having determined the time and place of landing; and that early in the morning they were travelling by rail to the market, whence they would be distributed over the country. The question is, what sort of inspection could have taken place in regard to these cattle, which would have been duly examined if they had reached the port of London. This inspection is the first great point.

The next is to separate, and keep separate, the foreign beasts in lairs and market stations of their own, till their condition is proved to be harmless. The third is a matter of enormous importance, and of no manner of doubt. The filthiness of the railway trucks in which cattle travel is such as fully to account for any propagation of disease through the kingdom. At this very time, when beasts with the "foot-and-mouth disease" travel, the trucks in which their rotten feet have stood, and which their ulcerated mouths have infected, are not cleansed for the reception of the next batch. It is even said that they are never properly cleansed at all. This is an affair of railway management. Railway managers must be appealed to, and, if necessary, compelled to cut off at once this source of disease; and they ought to be glad to rid themselves at the earliest possible moment of the responsibility of spreading disease and mortality, and of keeping meat out of the reach of the labouring classes by the neglect of the commonest cleanliness in their cattle trucks. The losses in Ireland from this cause—from the railway journey of English calves to port, and then the foulness of the vessels, and then another journey inland from the Irish ports—seem to confirm the worst statements of the drovers and doctors who call for reform in that branch of railway management. From eight to ten per cent. of cattle die of disease in Ireland, besides many more who cause loss by sickness; from ten to fifteen per cent. of sheep; and from ten or twelve to twenty per cent. of pigs. The Irish graziers and farmers lose even more by importations from England than the English do by importations from the Continent.

The question of a due expansion of the veterinary profession, and of a provision for the constant presence of a properly educated veterinary counsel and supervision, is too large to be entered upon here. The first care required, without any delay whatever, is to induce the stockowners to combine, as the Wiltshire farmers did in the small-pox case, to separate the infected from the sound cattle; to secure a due inspection and disposal of imported cattle, which shall allow only the healthy and harmless to go inland; and to compel the railway managers, at



once and everywhere, to provide cleanly carriages for the conveyance of stock. When this is done, we may begin to see some prospect of an end of diseased meat in the market, pernicious milk in the pail, and beef and mutton selling at 9d. and 10d. per lb., while bread is cheap, and the labourers are wondering why meat is so far out of their reach, in these days of free trade and agricultural improvement.

## NOTES ON THE OCCURRENCE OF TWO EXAMPLES OF *TÆNIA MEDIO-CANELLATA* IN THE SAME PATIENT.

By EDWARD HEADLAM GREENHOW, M.D., F.R.C.P., Assistant-Physician to the Middlesex Hospital.

Early in May of the present year I was consulted for a young gentleman, aged three years and a half, who had been suffering from tapeworm for eighteen months. I did not see any portions of the worm, but was informed that the little patient had been under treatment for more than a year, and that various remedies had been tried without success. The child looked exceedingly fragile, was thin and anæmic, and the tongue was slightly furred; but beyond these there were no symptoms of illness. I prescribed half a drachm of the ethereal oil of male fern in cinnamon water, to be given at night, followed by two drachms of castor oil in the morning. I also prescribed a course of steel wine on account of his anæmic condition. The child's parents residing some distance from town, I merely learned by letter, in the course of a few days, that the remedy had been successful in causing the expulsion of a large quantity of the worm piecemeal; and I heard no more on the subject until the 21st ult., when the child was brought back to me. I was then informed that the child had continued well for many weeks after I had seen him, but that at the end of that time segments of the worm had begun to reappear in the evacuations, and the oil of male fern had been again prescribed for him by a physician in Scotland, causing, as before, the expulsion of large quantities of the worm in fragments. Now, however, after a fresh lapse of time, segments of the worm were reappearing, and the child, who had greatly improved in health, strength, and spirits under my former course of treatment, had now fallen off again in these respects, but still without any more definite symptoms of illness. On this occasion some segments of the worm were brought up for examination, which did not appear to me to belong to the common tapeworm (*Tenia solium*). I now prescribed two drachms each of oil of turpentine and of castor oil, with one drachm of the ethereal oil of male fern and three of peppermint water, to be taken early in the morning fasting; and requested that whatever portions of worm might be expelled after taking the medicine should be sent to me for examination. In a few days I received two bottles, one containing what proved to be two nearly entire tapeworms, and the other a few very small segments, apparently completing one of the worms all but the head or the root, as it might perhaps be more properly called. Neither of the heads, however, could be found. On examining the specimens, my opinion that they were not examples of *Tenia solium* was confirmed; and having submitted them to my friend Dr Cobbold, lecturer on zoology and comparative anatomy at the medical school of the Middlesex Hospital, who has devoted special attention to the study of human parasites, he pronounced them certainly to be specimens of *Tenia medio-canellata*—a parasite which is generally considered to be very rare in this country, but which he believes to be much commoner than is supposed.

Perhaps there is no remedy so generally successful in the treatment of tapeworm as the oil of male fern, but occasionally, as in this instance (in which it was tried at least six or seven times) it fails. Probably such cases resemble the one under consideration, in being cases, not of *Tenia solium*, but of *Tenia medio-canellata*, in the treatment of which Küchenmeister says, that in his experience the male fern scarcely maintains its reputation as an anthelmintic, but that the oil of turpentine, in various combinations, proves more frequently successful than any other remedy. The history of the present case also bears out Küchenmeister's statements with regard to *Tenia medio-canellata*, that the suckers of this parasite ad-



here much more pertinaciously than those of the *Tania solium* to the mucous membrane of the intestine, and also that when the head has not been destroyed, the segments begin to reappear in the evacuations after a lapse of about ten weeks. In the present case it is possible that the heads of one or both of the worms may have been expelled, and yet have escaped detection—a question which can only be determined by the patient's remaining during three or four months free from any reappearance of the parasite.

## INFLUENCE OF LONDON COWHOUSES ON THE PUBLIC HEALTH.

(From the *Lancet*, December 12, 1863.)

IN the recently published Report of the Medical Officer of Health for the St Giles's district, Dr Buchanan, on the sanitary condition of that district in 1862, an interesting and instructive illustration is given of the influence exercised by London cowhouses on the public health. The Amended Act, 25 and 26 Vict. (cap. cii. § 93), passed in the year 1862, gives to justices of the peace power to licence places to be used as cowhouses in the metropolis. It provides also that district boards may show cause against the granting of such licence. The Board of Works of St Giles's sought to give effect to this provision, and opposed the granting of any licences to cowhouses within their district. Not satisfied to rest their opposition upon general arguments on the physical injury inflicted upon the inhabitants of crowded neighbourhoods by the presence of cowhouses, the mortuary statistics of a particular locality within their own district, and contiguous to a cowhouse, were subjected to examination. Stacey Street is situated in the most densely populated and most unhealthy part of St Giles's. On the north side of the street, between New Compton Street and Lloyd's Court, are ten dwelling-houses. Towards the western extremity of the street, and in the rear of the houses numbered 7, 8, and 9, are a series of cowsheds. The mortuary statistics of Stacey Street extend over six years. From these it was ascertained that, "three houses excepted, there had been an average of three deaths in each inhabited house, and in none a higher mortality than six in the six years. But in the three houses, Nos. 6, 7, and 9, there had been an average mortality of *ten* deaths each—viz.: in No. 6, *seven* deaths; in No. 9, *nine* deaths; and in No. 7, actually *fourteen* deaths." Now No. 7 was the house most directly connected with the cowsheds; Nos. 6 and 9 were the two houses flanking them; and No. 8 consisted only of workshops and the entrance to the cowyard. In the three houses, Nos. 6, 7, and 9, *thirty* deaths occurred; while the other inhabited houses in the street, numbering fourteen altogether, had but *forty* deaths between them. "The only two fever deaths in the street were in the houses abutting on the cowyard. Three out of five deaths from diarrhoea occurred in them. Out of ten deaths from acute lung diseases, which follow (as has often been shown) the zymotic diseases in their distribution, and depend upon similar impurity of air, eight took place in these three houses."

No attempt was made to estimate the influence exercised by any other cowhouse on the health of the people living in the vicinity. "But on the strength of the facts here ascertained," writes Dr Buchanan, "the reply was not difficult to the question of the Council who had been retained in the interests of these nuisances—'Do you mean to say that a cowhouse and yard is more detrimental to the health of a neighbourhood than if the same space were covered with poor houses?' 'Yes, it is positively so.'" The magistrates, however, refused to abolish altogether the cowhouses of St Giles's, but in granting licences they cautioned the cowkeepers that such orders as the Board of Works might make for the regulation of the sheds must be obeyed. The Board thereupon issued a series of rules well calculated to mitigate the nuisance of cowhouses, if they could be rigidly enforced: but Dr Buchanan tells us that "in June 1863, any improvement that may have been made in the cowhouses is scarcely appreciable. The decision of the magistrates that retained the cowhouses seems to have been construed by most of their proprietors into an assertion of their right to continue the nuisance of their establishments unmolested. One at least of the sheds is actually in a worse state than



before the recent regulations were issued. This defiance of authority appears another argument for suppressing, instead of attempting to regulate, the nuisance of cowhouses in St Giles's."

In the parish of St James, Dr Lankester has acted with his customary vigour in inducing the vestry to assent to the abolition of cowhouses in the parish ; and we believe that in a very short time he will have rendered his district the great benefit of sweeping away all these sources of zymotic disease from the crowded localities in which they are now placed.

### CATTLE-TRUCKS.

(From the *Scottish Farmer*, December 9, 1863.)

HAVING insisted so long on the imperative necessity for the adoption of preventive measures to check the progress of contagious cattle and sheep disease, the time seems to have arrived for the recognition of the importance of the subject. Not only the farmer, but the general public, seems to be taking a great interest in the discussion recently commenced in *The Times* and carried on in a number of influential papers of all kinds. The rapid propagation of the foot-and-mouth disease, after all the autumn fairs, has drawn attention to the condition of the cattle-trucks, which have perhaps fallen in for too large a share of the blame connected with the spread of contagious disease. No doubt, they are constantly protecting animal poisons and disseminating them, but it were well if we watched the origin of these poisons, and prevented them ever reaching the British cattle-truck. Many are ready to exclaim, "This is impossible !" But we hold that it is quite possible, and our efforts should be directed in that channel. We must prevent the contamination of cattle-trucks, and adopt other precautions for their purification, when we have reason to believe they are likely to have been impregnated with virus. We commend Mr Mechi's suggestion to the attentive consideration of railway companies. A strong column of water impinged in every nook and corner of a cattle-truck is the best purifier we can get. The work must be done well, and the scrubbing-brush must not be overlooked. We know, however, that, unless looked after very closely, the servants of railway companies would neglect this duty. They ought to scrub the trucks now, but they don't. The traffic is so active that want of time and opportunity may be pleaded as extenuating circumstances in harbouring dirt and corruption. We need something more than the flushing system. Cheap antiseptics may be used, such as Macdougall's disinfecting powder or liquid, and perhaps some of Mr Condry's permanganates. Why not have an official inquiry in the subject ? Red tape is against us, perhaps : but the open doors of Parliament will admit willing members next session to take up this all-important subject of cattle disease.

We must draw special attention to sheep-trucks. It is an incontestible fact that at the present time scab is prevailing more than it ever did before. The sheep sent south from Scotland have suffered enormously, and we hear that the disease is very rife in the west as well as in the east of England. This scab, like the foot-and-mouth-disease, and the lung-disease of cattle, is due to foul markets and foul trucks. Scabby sheep are constantly exposed for sale. They are placed in pens made of wood, which soon rots and splinters. The scabby sheep rub and scrub the insects and wool into the porous and broken wood ; a flock of healthy sheep placed in the pens on the next market-day, find microscopical insects, which are starving after birth, in their wooden nest, and which only too greedily penetrate the fleece they can approach so as to burrow to the skin and propagate their species. The scabby flocks deposit the germs of the disease which torments them everywhere. Farmers well know what it is to get a really foul ground. How to clear it ? What must a sheep-track be in which, week after week, every opportunity is afforded for the propagation of living germs of destructive parasites from diseased to healthy animals ? We want more than flushing here ; and some active preparation should be used to kill all vermin which are likely to become imbedded in the fleeces of sheep.



# EDINBURGH VETERINARY REVIEW

AND

## Annals of Comparative Pathology.

---

### ORIGINAL COMMUNICATIONS AND CASES.

---

*The History, Progress, and Present Requirements of the Art of Horse-shoeing ; with an Outline of Views on the Mechanism and Economy of the Foot of the Horse.* Introductory Lecture. By Professor GAMGEE, Senr., New Veterinary College, Edinburgh.

It is a custom adopted by men generally, when about to embark in an undertaking, to inquire into the actual state, and history, of the subject in contemplation ; and in no case does that sound practice recommend itself more to notice than when young men are pursuing the study of a branch of knowledge destined to influence their usefulness and professional status throughout after life.

Rational man aims constantly to multiply knowledge ; he keeps records of the progress already made, and, with such guidance, endeavours to advance laudable works by all legitimate means.

There can be no doubt that knowledge does occasionally become lost or forgotten for a time, and of its requiring to be sought after and revived ; neither is it invariably the case that new ideas are better than the old, which may have been partially supplanted ; and it is from the stores of historic records, whether of one year or a thousand past, that we may draw and re-adopt knowledge which had been inadvertently laid aside ; moreover, nothing good can be built on hastily entertained hypotheses.

The old adage, "No foot no horse," has ceased to convey the same impressive meaning it used to do. The sentence, it is true, is often reproduced, but, like a distant echo, excites little heed, since it is common to see horses without a sound foot to move on, working in every town in the kingdom. At no time in the history of veterinary medicine was there more urgent requirement for retracing our steps and inquiring further into this subject than now.

Does horse-shoeing belong to the class of industrial callings, the exercise of which is a mere manual procedure ? or does it partake of a science as well as an art ? Liberal-minded able men, of different nations, have pronounced the calling to consist essentially of science



and art. Therefore, in order to arrive at some understanding of the question, it is well to determine what is implied by the term science, and what is an art ; and, later, we shall try and throw some light on the matter, by inquiring into the claims of horse-shoeing to the attention of the scientific physiologist.

Science, in its full acceptation, embraces all those subjects or systems governed by laws of their own, of which subjects or systems the human mind can hold cognisance.

*A science* is a subject of human knowledge which has laws peculiarly its own. The carrying out, wittingly or unwittingly, of such laws into practice constitutes *an art*.

Art, in its full acceptation, is the carrying out into practice, wittingly or unwittingly, *natural laws*.

Examples may be extended to illustrate the above definitions ; for instance, medicine and surgery, whether regarded in their application to man or the lower animals, cannot, in their separate or combined character, be called science. The laws of chemical combination, of animal and vegetable physiology, of mechanics, &c., do, it is true, form the foundation on which the art is built—and so far, several distinct branches of science minister to the healing art ; and yet the most proficient knowledge of one or more of the sciences would avail little to fit a man for practice, until he devoted time and labour necessary to accomplish him to work out the details, and that, not only in the art of medicine, but whether it be of painting, music, or any other art.

Horse-shoeing—the care of horses necessary for the perfect development of their feet, the preservation and restoration of structures—form essentially an art, the carrying out of which demands a large acquirement of knowledge of functions,—in other words, of the science of physiology.

The veterinary student or practitioner, instead of depending for his knowledge of the locomotive system of the horse, on sources beyond his own school, should be able to render something to the anatomist of the human frame in exchange for much, for which we are constantly becoming indebted ; since the horse holds the foremost place amongst animals for the exquisite beauty of his locomotive system ; and when it is considered that the worth of the horse depends on his action, and that the action depends on natural form, complete development and preservation of every structure, the importance of a thorough understanding of the whole subject will be seen.

In selecting an epoch whence to start on our inquiry into the state of knowledge of these subjects, one near our own time might seem, on first thought, least liable to misrepresentation, yet it is found that confusion is most confounded when we look to our own time, as we have much irrelevant evidence with which we have been long familiar, whilst, by going back in the inquiry, and re-examining some of those sources of truth which have stood confirmed for many



hundreds of years, we discover land-marks for our guidance, and, by bringing up sufficient arrears of knowledge of the past, may form a correct estimate of the relative state of questions, and particularly of the best course for our adoption.

Xenophon, the commander in the famous retreat, four hundred years before the Christian era, is an authority on the horse and horsemanship never to be passed over whenever a full inquiry into the well-being or misery of that animal is sought to be gone into. It is true that each borrower selects the passage from that great authority best suited to throw light on his particular views; in Xenophon's writings, proof is afforded of a consummate knowledge of the horse possessed by the author, which he has transmitted to posterity in a clear and eloquent style, and with a freedom from errors and prejudices not to be found in many works produced in after ages.

I especially refer to this ancient writer because we find each separate series of observations and advice on the management of horses treated independently. The structure of the limbs and feet of the animal, his action, and the right mode of management, are all discussed on physiological grounds; the art of shoeing had then to be added, therefore we will contemplate with our author one thing at a time. For my own part I only accept this evidence to show that the art of shoeing was then unknown, to the extent that it is conclusive that in Greece and other eastern nations known to Xenophon shoes had not up to the time been brought into use.

Xenophon, in his treatise on Horsemanship, after giving directions for the selection of a horse, proceeds to instruct the young military men of his time how to manage their horses, and says:—"The same attention which is given to supply the horse with food and exercise that he may be strong, is also requisite to be observed in order to keep his feet in proper condition. Moist flat floors will injure even those hoofs which are by nature good and sound. The first evil is to be remedied by a declivity in the floor; the second may be prevented by making a pavement, each stone of which it is composed being about the size of the horse's hoof. This sort of pavement will cool, harden, and improve his feet, merely by standing upon it. The groom must remember to lead the horse out of the stable when he is to be cleaned; and in order that the stable-yard may best answer the purpose of hardening and strengthening the horses' feet, let four or five loads of round stones of about a pound weight be thrown down in it, having a ridge or border of iron, that they may be kept together, and not scattered and lost. The horse being obliged to stand upon these stones, will procure the same advantage to his hoofs as he would if he went upon stony roads every day; and when he is *being dressed*, it must necessarily happen that his hoofs will be used in the same manner as if he walked abroad. These stones will harden his feet."

I shall not encumber my subject with quotations from many of



the old Italian writers. In the main, the notions of the Greek author just referred to were adopted, and are frequently spoken of; hence we may infer that Xenophon's precepts became extensively popularised.

I shall make choice, however, of one from amongst the illustrious Italian writers of the sixteenth century, to show the state of knowledge on horse-shoeing then, which was evidently considerable, and bears no trace of newness.

The work which I find of great value as establishing evidence regarding the state of such knowledge in the early part of the sixteenth century, is entitled, "*La Gloria del Cavallo*," by S. Pasquale Caracciolo, a Neapolitan cavalier, who published ten books on the horse in 1567, and which were republished with corrections in one volume, at Venice in 1585. In this volume, consisting of 970 closely printed folio pages, Caracciolo has referred to antecedent and contemporary authors and practitioners, so freely, that his work reflects back, showing the customs long anterior to the time in which he wrote. Book the seventh, which comprises 96 pages, treats on the discipline and general management of the horse, including ample details on shoeing, and to this part I shall confine my particular notice.

Page 597, "It is certainly a very important thing above all others to conserve this highly useful animal in a state of soundness, and free from defects of every kind in his legs, feet, and hoofs, as those are the parts in which consist all the utility which can be derived from him; from whatever cause, when a horse cannot freely use his legs and feet, I see nothing for which he can be of service unless to frighten the birds by the nodding of his head. And when the hoofs require their growth promoted, since it happens at times that, from ignorance, the shoers in their zeal to open the quarters and thin the hoof, make it to collapse and become hard, whereby the horses' feet assume deforms, not only like those of the mule, but become heavy, painful, and rings form round the hoofs, with cracks, quittors, &c.; it is most important and necessary to the case, that the horse be well shod; as it is from bad shoeing that arise, not only the above named evils, but others, also dangerous and difficult to cure, which often render useless to the master his admirable horse; and I advise every one who has love for his animal to give the charge of the shoeing to expert farriers, who have had long practice in this art, but, above all, that they be men of good science. If the heels be much higher than necessary, lower them, by cutting only in the line on which the shoe is to be seated, but mind not to touch the interior part (the sole), because if we remove the strength of the foot, we spoil the provision that nature has made, and which every one should apply his ingenuity to maintain in its amplitude; whoever cuts the sole and frog, thereby thinning the horn excessively, is apt to cause the occurrence of false-quarters. The fore shoes should not be broad of cover, because their strength is not to consist in amplitude of breadth but of substance, which



should be equal at the heels and toe—to be stamped as much as convenient towards the toe. The iron should be well hammered and bevelled, facing the sole, and made smooth, in order that the outer border of the shoe be seated equally and exact. Let no part of the shoe spring or roll (balli), so as to become bright by the friction with the hoof against the shoe ; it is right to cut the hoof in form, and at the point the shoe should be firmly seated, by which the horse will repose with the strength of his foot on the ground, and thereby keep his legs in a proper line, and his hoofs will be secure from every destructive influence.

On the hind feet, if one could become understood by a word, we should say that the hoof requires to be cut and prepared differently to that of the fore-foot ; but, to state more clearly, it should be known that little should be cut away from the point, as the hind foot has its chief strength at the heels, and at the toe the quick is very near.<sup>1</sup>

It is proper to provide for the part where there is the least strength ; and that the shoe at the toe be so exactly fitted that not a particle of hoof be cut from that part with the knife.

The hind shoe should be such as to cover equally the point, the quarters, and heels,—prepared without calkins and neither to be too narrow nor too wide, but to have an equal bearing all over, taking a good bearing on the heels, where these are so well able to sustain, when the horse will be assisted to keep good pace on a journey.

Nails, both for fore and hind feet, should be broad, thin, and long : broad, that they may possess strength, which cannot be given by gross substance ; thin, that good holds may be taken without pressing on the vital part ; long, that by there being enough shank to turn down and cut off where the shank is strong, in order to obtain a strong, short clinch, the shoes will not be loose on the road. The nails should be applied in this way,—the holes to be stamped near the outer edge or rim of the shoe, so that the shank of the nail passes direct through the wall in the strong part, without fear of pricking the foot.

When the nails are driven straight, and all equal, they have most force and cannot injure. True it is that in applying the nails the point must be made to take an outward direction.

Colts should go long without shoes, that their hoofs may grow strong and hard, which result will be attained if they be put to graze on stony and hilly pasture.”

Calkins are not approved for fore feet, even in frosty weather ; frost nails are preferred, directions about which are given by the author : better, he says, use such shoes as are usually applied to genets, and

---

<sup>1</sup> Not to add strength to already too prevalent a notion, it should be borne in mind that the scarcity of hoof at the point of the hind foot would be more apparent than real, since the phenomenon would show itself in horses that had gone without shoes until the point was worn short and thin, and the foot looked stumpy, showing where the wear is greatest, rather than where least horn is produced.



race horses when they have to run, which give no inconvenience to the foot, whilst they grasp the ground admirably.

To prevent cutting, Caracciolo says at page 607, "Others make distinction between horses that cut through being tired or in bad condition, and those which cut through natural malformation; calkins should not be used to the outer heels, neither for fore feet nor hind; on the contrary, on these parts the hoof should be lowered somewhat, and the shoe made thicker on the inside."<sup>1</sup>

Having taken a cursory review of two epochs in the early history of knowledge on the management of horses, especially as it had reference to their feet and the art of shoeing, I have only briefly to remark, that from the earliest of these we have the very best instruction on the economy of the feet and limbs of horses, whilst there is absence of mention of anything in the form of a shoe for constant use, or any iron shoe at all; we have, in fact, the correct account of the structure and functions of the foot, and the way to treat the horse in order to secure the perfect development and condition of that organ, laid down by Xenophon, with a clearness and brevity such as may be in vain looked for in modern writings.

Caracciolo has been selected from amongst the Italian writers from the value I attach to that author for the ample detailed accounts on the art of shoeing which his work affords us, and those not merely derived from his own experience, but consist of accumulated descriptions derived from contemporary and antecedent authorities. Thus the work of Caracciolo, published during the latter half of the sixteenth century, may be regarded, when we consider how slowly books were multiplied and opinions developed in those days, as the exponent of knowledge and customs prevalent amongst the Italians of the fifteenth century.

Carlo Ruini (1599) may be regarded as the writer amongst the Italians, and also the one in all Europe of the sixteenth century, who did most to establish a veterinary science, by means of his great work on the anatomy of the horse, illustrated with many beautifully executed plates. Ruini was a Bolognese senator, and, as his work shows, was one of the first anatomists at the time when the Universities of Bologna and Padua were of the highest renown as schools of medicine. Ruini's works were published only a few years before William Harvey became a student at Padua prior to his adding the last links to the chain, and giving a plain description, for the first time, of the blood's circulation. The author of the time, of the great work on the anatomy of the horse, though not much referred

---

<sup>1</sup> The caution that the author of old gave, telling his readers that they were not to raise the outer heel of the shoe, by which the foot was found to tilt inwards, and give rise to inconveniences, has been followed by an error of the opposite kind, that of making shoes clumsily thick on the inside, becoming the cause of cutting, of splints, spavins, &c. Shoes thick on the inner heel and thin on the outer are commonly attributed to Moorcroft as the originator, at the end of last century; and they form one of the worst traits in ordinary hind-foot shoeing with us.



to in connection, advanced the labour which Harvey afterwards took up.

Passing over the names of a host of writers on the art of farriery at this period, mostly French, I come to one whose life and work, I consider, mark another epoch in the order of time with reference to our inquiry.

Solleysel, who wrote in 1664, embodied, like Caracciolo, a very copious *résumé* of the state of the art in his time; more especially have we to read Solleysel as a great original observer and expositor. His description of the horse's action affords proof that he possessed a knowledge of that subject such as is not displayed by any one since Xenophon wrote, amongst those whose works I have seen; and whilst Solleysel exhibits equal appreciation of the natural and beautiful in the phenomena and system exhibited by the Greek author, he gives new and independent details.

Solleysel lived in an age when the art of farriery had made great progress. We have seen something of its state a century earlier in Italy; and in the seventeenth century many able writers appeared in France, who treated on the art of shoeing, and the locomotive system of the horse; and it is these features which chiefly stamp the merit of our author's great work.

At the time Solleysel and the other men of his generation wrote, they enjoyed the advantage of the great work of Ruini—probably the greatest original work ever produced on the same subject at the time, and that which gave all subsequent writers on the veterinary art an advantage over those of earlier times.

From the time of Solleysel, writers on the art of farriery appeared in numbers more noteworthy than previously; of these, France, Italy, and Spain contributed, as did also Holland and England. The first named nation, however, took the lead at that period, and subsequently; as about 1760, the great Bourgelat, the originator of veterinary schools, first appeared as the reformer of antecedent customs in treatment of the lower animals.

Probably no man so thoroughly established his claim to be called a scientific veterinarian as Bourgelat did; whether we judge of his merit by his writings, his success in laying the foundation of veterinary medicine, or by the common consent of those who lived near his time, all tend to fix the belief that he ranks the first amongst veterinarians; and though his fame belongs to France, his memory will long be cherished by members of the veterinary profession of all nations. The economy of the foot of the horse, and the art of shoeing, were the subjects to which Bourgelat devoted his distinguished talent with greatest perseverance and earnestness, and his essay on the Theory and Practice of Shoeing, published in 1771, will be read with profit by generations to come.

As may be expected, the veterinary art assumed a new aspect, and a new era dawned upon its literature from the epoch char-



acterised by the works of Bourgelat, which consisted not of writings only, but of actions, in connection with the two schools he founded.

Though in England we had as yet no veterinary school, there were shrewd, practical horsemen, and, by the combined influence of the natural soil and care taken, England possessed the best horses in Europe, at least a century ago, as incontestably as she does at the present time. Equally undisputed is it, that we had no such men skilled in the knowledge of veterinary surgery as Bourgelat, and as some others of his school soon became.

Due respect was conceded by the ablest horsemen of our country to Bourgelat. The Earl of Pembroke, in his work on Military Equitation, gives the highest praise to his friend, as the noble Lord in his writings styled him.

Happily there was one man in England contemporary with the founder of the French veterinary schools, of whose name and work we may feel proud. As the author of a standard work on the anatomy of the horse, George Stubbs has stood almost, if not quite unrivalled. Stubbs published his great work, with plates, in 1766, and though it was not given to that accurate anatomist to establish a veterinary college, he certainly gave to those who followed the most essential material to found a new school.

In the year 1791 a veterinary college was established at London, and, as is generally known, a French gentleman, bred to the veterinary profession, and an *élève* of the Lyons School, was elected as the first to occupy the professorial chair at St Pancras. Mons. Vial de Sainbel, who had come over to England with introductions, for the purpose of setting on foot some plan for giving instructions on the veterinary art, arrived at a propitious time—the death of the famous horse Eclipse happening soon after, when M. Sainbel's proficiency as an anatomist of the horse, led to his being chosen to dissect Eclipse, and to prepare the natural skeleton of the horse for preservation. He also wrote an essay on the proportions of that horse. The above accidental occurrence brought Sainbel so prominently into notice amongst noblemen and gentlemen of high influence, that, in the absence of any rival, he became the pointed out candidate for the professorial chair, and accordingly was elected by unanimous votes. It was the Essay on the Proportions of Eclipse which gained for its author such notoriety as an anatomist of the horse, and led to his election as the first Professor of Veterinary Medicine in Great Britain.

On the merits of his essay, I have been able to form an estimate, owing to the fortunate acquisition by the New Veterinary College of the skeleton of the famous horse, purchased of the late Mr Bracy Clark, in its natural state, as Sainbel prepared it, and which is now placed in this Museum. Extraordinary as some of the measurements appeared, the figures put down had been regarded as unerring; and, instead of questioning their accuracy, the correctness of the diagrams, or the statements set forth in the text, these were passed



almost without scrutiny,—and whatever was seen to be different in form to corresponding parts of other horses, was put down to the wonderful proportions of that wonderful horse. Finding Sainbel's description of the horse thoroughly at variance with the *true* skeleton, and finding his theory on action to be altogether a mistake, I investigated the whole scheme, after it had been for nearly seventy years a false guide to inquirers into the form and action of horses.

It would not, however, be safe to decide on the relative fitness of Mons. Sainbel to be placed at the head of a school, by reference to the single work, especially when it has to be taken into account that during the short time he lived after he performed the dissection and wrote the text, he was much occupied, and time was not given for the correction of mistakes. So much, at least, may be said for descriptions of form. Of the action, the same allowance cannot be made; there he put the legs of the horse in position, and described their movements, and order of sequence, totally at variance with the true action of any of the horse species or that of any other animal. Again, it is not more wonderful that one man should take erroneous views, or that he should adopt such as were entertained at the time, than that for seventy years afterwards, with the progress of the veterinary art, and the numbers who prosecuted the study of the anatomy of the horse, no one should have analysed the subject and pointed out Sainbel's errors. All this affords an instructive lesson, teaching us the danger of promulgating error, which, when once accepted, there is no telling how long it may reign, or the extent of confusion and mischief that may result, as in the case above.

Looking at the regulations laid down on the first establishment of the Veterinary College, under Sainbel's superintendence, and judging from reports given by those who knew him, I believe in his being the most fit man for the post, and that his early loss was great and irreparable to the future of veterinary surgery.

The time laid down for continuous study and work at the college; previous to granting a final examination, was three years—one less than has always been enforced as the minimum for pupils to remain at all continental schools; and to show that the rules were intended to be carried into full force, the following clause may be cited,—“No pupil will be permitted to go to London (from St Pancras), except by the desire of a parent, guardian, or person properly authorised by them, expressed by a letter to the Professor, unless on some particular emergency, of which the Professor shall judge, and report to the committee at their next meeting.” Rather strict surveillance this, considering that, even taking the boundaries of London in those days, the college was scarcely a mile distant, Old Somers Town and a grass field only intervening. The above clause, shows plainly its own origin—it is, like some others, a translation from the French; their schools being conducted under a modified military discipline, where the pupils are resident boarders, and the



colleges all erected within spacious grounds ; and that which would be found to answer well there would be incompatible with freedom of action to men of an age, such as those who went to the English College, which, on the whole, was established in accordance with English custom, by public patronage, and not dependent on the sovereign or government for existence, as elsewhere was the case.

Most earnestly did the professional and commercial men of this kingdom respond to the demand for the establishment of a veterinary college, as we see by reference to the list of names of those who enrolled themselves as subscribers. In 1793, the second year of the existence of the college, there were 93 life-subscribers, and 860 noblemen and gentlemen who had put their names for two guineas annually ; 89 bankers, or other men of position, had also consented to receive subscriptions for the college over all parts of the kingdom.

The wealthy of Scotland, true to Scottish traditions, always foremost in a good cause, appear conspicuous amongst the earliest promoters of the London College.

Next to the Royal Princes, stand at the head of the list of patrons and supporters, the names of the Dukes of Athole, Buccleuch, Montrose ; and of Lords Breadalbane, Elcho, Fife, Kinnaird, Morton, &c.

On the 21st of August 1793, after seventeen days' illness, Mons. de Sainbel died—less than eight months after the infirmary of the College was opened for the reception of sick horses, which took place on the 1st of January of that year.

In the same year, and within two months after the death of Sainbel, the college lost the best and ablest of its promoters—the great John Hunter was cut off in October, following the month of August in which the Principal of the College died, and not only had a difficulty arisen by the untimely loss of a zealous and able teacher, but that difficulty was augmented, and perhaps the greater loss to the future wellbeing of the veterinary profession was sustained, in John Hunter's demise, who, as long as life and health remained, was a reliable adviser and guide on all important occasions, such as where the choice of a teacher of the proper calibre was involved.

We have now to review a period in the history of veterinary medicine in England the most important,—a period when steps were taken which have affected the progress of the art in all time since. The election of Sainbel's successor was a measure requiring knowledge of duties to be performed, and of men, whilst we find no such knowledge conspicuous amongst the executive, taking their acts for our criterion.

Mr Coleman succeeded to the post of Principal and Professor, at first in conjunction with Mr Moorcroft, but was soon after installed into these, and a multiplicity of other posts, as sole occupant.

Edward Coleman, at the usual age, according to the custom of the time, served his apprenticeship to a surgeon and apothecary at a town in his native county, Kent, from whence he afterwards removed to



London, and became house-pupil with the late renowned surgeon, Mr Cline ; meanwhile he attended the classes of medical instruction at the Borough Hospitals. Having pursued his studies under such favourable circumstances, in so far as connection and facilities for advancement promised, whenever opportunity occurred, we perceive the road by which the Professorship of Veterinary Medicine was obtained, without the possession of the special scientific, practical, or technical knowledge which the occupant of such a post should have commanded.

It would be difficult to find a parallel case, where a young man, trained for the ordinary duties of one profession, became elected to such an exceptionally important appointment in another, the duties of which consisted in rearranging all the materials of an old art, and of founding a new profession, without any time intervening to work the required change. It is very clear, as the sequel will show, that the professorship was made for the man, and not the man for its requirements.

I am not, however, about to discuss the question of Coleman's merits on *à priori* grounds, but to speak of events that happened, and in doing so shall endeavour to point out some of the causes that gave rise to effects, still to be deplored with unabated intensity.

In attempting to give a cursory exposition of the history of the art of horse-shoeing in this kingdom, I have necessarily to dwell much on the part which the late Professor Coleman took, since he, though not in fact the first professor, may, for all practical effects, be regarded as such, owing to the accidental early death of the first before the college had got fairly into working order.

It is not a pleasant task to undertake, to write or speak otherwise than in praise of those, who in early life we held in respectful esteem ; and such was my position towards Professor Coleman, whose character, during the early years of my professional career, I should have defended with as much earnestness as a sailor would that of Nelson, or as the soldier would exult in the deeds of Wellington ; but at this period of my life, after working incessantly with a purpose in view for full forty years, I consult my pleasure only in so far as that results from a performance of duty.

In referring to events of seventy years past, we are fairly in the domain of history ; and I therefore assert what I shall presently show, that no analogous instance can be pointed to of a veterinary school being established for the purpose of placing the art on a scientific foundation, and the end being defeated, to the same extent as in the case of our school under the monopoly of Coleman.

Mr Coleman, seeing the drift of public complaints, determined, from the outset of his professorial career, that the foot of the horse should receive his most energetic attention, as it did ; he said, "a proper mode of shoeing is certainly of more importance than the treatment of any disease, or perhaps of all the diseases incident to horses ;" and I am persuaded that from first to last he saw the



importance of the subject ; but I am equally persuaded now, that he never went the right way to work, to master the difficulties of the occasion, or dispel them. He began by imposing on others, and all along deceived himself.

Mr Coleman published the first part of his work on the Foot in 1798, just three years after he took to the veterinary art.

That large book he entitled, "Observations on the Structure, Economy, and Diseases of the Foot of the Horse." The book, especially when read as a whole—the second and last part having been brought out four years after the first—is a remarkable production. The young professor, who wrote when he should have been reading and working to prepare for such a task, scarcely condescends to adopt a sentence of what former writers had produced in antecedent centuries ; and since he had nothing of his own to say, what he took from others was so metamorphosed that it required an experienced reader to give the right value to each part. I shall abstain from making many quotations from the work under consideration, since almost every page affords proof of what I am showing.

The notions held by the Professor, and which he succeeded in establishing, were that—"the hoofs of the fore feet are as wide from heel to heel as they are long ; that is, the bottom of the hoof approaches to a circle." "This union," he says, "of the crust with the coffin bone, sustains the weight of the animal." Mr Coleman lays it down as a rule, that the natural hoof is of a conical form, and that all deviations represent deformity or disease ; and he arbitrarily divided the hoof into five parts, with their supposed functions. The wall, by the laminated attaching medium with the coffin bone, he said, sustains all the superincumbent bearing, that the sole acts as a spring, yielding downwards ; the bars press open the heels, and the frog was made to bear on the ground or a bar shoe, which bar shoe, according to such notions, he constructed. With functions so fanciful an upward pressure was also assumed, which forced up what the author said was a collection of oil-cells, which he called the fatty-frog. In such a way we were shown the primary notion of a hoof bulging above and below at every step the horse took, and reassuming its lesser form when the foot was lifted. In directing attention above the hoof, we were told that the sessamoid bones are supported by an elastic ligament, called, after its supposed function, the suspensory ligament ; that the splint bones were connected to the shank bones by an elastic substance, and that here we have so many means to prevent jar to the foot. The weight, our author says, as the foot comes to the ground, is conveyed partly on to the splint bones, which, from their position and elastic attaching medium, descend and break the force ; the sessamoid bones do the same thing in kind, only with more range of movement ; the navicular bone he described as descending in the same way ; and the laminae, the Professor also made out, were "highly elastic, and elongate every time the foot comes to the ground," that the coffin bone descends, the sole



answering like the spring of a carriage, flattens down, and the side of the hoof, he said, expands.

The above is a brief sketch of Mr Coleman's dogmas on the structure and economy of the foot; and presently we shall see his principles of shoeing, &c.

I think it necessary to show the source of so much bewilderment, which all of us, subsequent to such teaching, have had to encounter. I am the more desirous to be plain, because that which was promulgated in 1798 was taught by the same author in 1838, and because the absurdity of these notions has never been effectually exposed, and therefore, for all influences, is in full force still.

Coleman has been the direct or indirect medium by which almost all veterinary surgeons in this kingdom have received their instructions on the foot of the horse. Since the London Veterinary College was established, other departments of the art have received attention, but this has lain where he left it, or rather the old story has been told in new ways. Coleman's great romance, for as such his book on the Foot may be regarded, has been succeeded by lesser—works written by good and ingenious men in some instances, as in those of Turner, Percival, &c.—but none of them ever fairly emancipated their minds from the maze into which Coleman drew them regarding the foot, and shoeing. We owe much, it is true, to Mr Bracy Clark, who published on the foot in 1809, and continued to write for fifty years afterwards. Clark was an able controversial writer, and exposed the wrongness of Coleman's ways with more force and truth than any one else has done. Clark's work contains advanced views on the structure and functions of the foot, and considering that he laboured under the disadvantage of having no such facilities as a college and infirmary afford, his works deserve high praise. But even Bracy Clark omitted to give due credit to Freeman, Bourgelat, and other writers on the foot, of earlier times, whilst he fully acknowledged Stubb's merit. Parts of the foot which Clark laid claim to the discovery of, had been recently described by Freeman, and earlier by Bourgelat; still that Clark dissected and worked for himself, ample proof is given in his work.

On the art of shoeing, Coleman and Clark were about alike impracticable; the latter did not differ in his views from Coleman on some of the supposed movements of the foot; yet he insisted that the nailing to the horse's foot immovable shoes was the cause of all the evils which resulted from shoeing. Imagination carried Clark onwards, which, from exceptional specimens of the coffin bone, led to the introduction of extraordinary illustrations into his book. Amateur writers on shoeing, as well as some veterinary surgeons, have emitted curiously combined notions deduced from the conflicting opinions of Coleman and Clark; the former of these putting every one into a fright about the proneness of the horse to become diseased or receive injuries about the heels—from which the horn was ordered to be pared away, the shoe *sprang*, &c.; whilst the fol-



lowers of Clark advocated few or no nails. Some adopting both of these novel proceedings, added another, and taking a leaf out of Mr Goodwin's book, turned the fore shoe up at the toe. So we find the horse with a shoe with space between it and the foot at the heels, turned out of the line of bearing at the toe, and no nails on the inside.

On the other hand, I have exposed in a totally different aspect a series of structures, constituents of the horse's limbs and feet, and shown that these functions are diametrically opposed to those attributed hitherto according to the foregoing description.

If the difference between the past 70 years' teaching and my own on the mechanism and functions of the foot only extended to that of mere opinion on some phenomena, one need not be surprised to find that the small matter excited only passive recognition ; although it has been held in all times that nothing is too small to be worthy of notice which comes within the sphere of investigation, such as the Anatomist, Chemist, and Physiologist know how to value.

I have shown that the splint bones are not connected to the large shank bones by elastic material, but the most inelastic white fibrous tissue forms the normal intermediate structure.

I have shown that the great structure which takes its origin from the posterior part of the upper heads of the shank bones, and those composing the knee and hock joints, and which is finally inserted by several attachments into the pedal bone ; neither suspends the sessamoid or any other bones, nor does it partake in any degree of elasticity ; and I state again, that neither the pedal nor the navicular bones receive the weight from above in an oblique direction backwards, as has been affirmed. On the contrary, the navicular, sessamoid, and splint bones are not destined to receive weight downwards, but sustain exertion upwards, and I repeat that there is no elongating property or action in the laminated attaching medium between the pedal bone and cartilages on one part, and the wall of the hoof on the other, and that the arched sole was not destined to recede or flatten by force of the superimposed weight, but constitutes an essential support ; and I also maintain that the foot does not expand, widen, or bulge, when the horse presses down upon it, and I have demonstrated that such motion is inconsistent with the whole construction of the organ. On the contrary, every fibrous band entering into the formation of the foot, whether of ligament, tendon, or other tissue, converges in its line so as to impede dilatation of either the inner or outer structures, but just the reverse. When the foot is in exertion, the tendency of the whole is to draw inwards, and relaxation succeeds when it is lifted. My own foot and hand do the same, so does a dog's foot, and so does the paw of the monkey—in fact, the phenomena show us a section of natural law : give a boy a penny, and you will see, as he stretches out his hand, that the organ is open and relaxed ; but as soon as the recipient touches the money he grasps it, the hand contracts, and is drawn back. Again, if a squirrel, whilst leaping



through space, be observed, it will appear that all its claws, no less than its hairy tail, are spread out, and as it approaches the object aimed to alight on, whether a tree or the ground, the feet contract, grasp, and give the necessary spring onward. Just so does the horse. Though the uninitiated do not see the movements in the hidden structures of this animal, none the less is he endowed with such functions, more exquisitely, as regards kind and degree, than almost any other species of the larger quadrupeds.

In the first part of my lecture I adverted to two sources whence knowledge might be drawn, and which it was essentially necessary to cultivate, in order that our art of veterinary medicine should progress, and I may add, or even hold its place: these were, the history of its past condition, and the light which scientific research reveals to us. And I now assert that both these sources are prostituted to wrong purposes, and not being interrogated in a right spirit, tend to totally opposite results. For example, it was always the custom in our time to quote the same passage from Xenophon as I have done, but with a view to prove a very different and foregone conclusion. "Xenophon," Coleman used to say, "directed that horses' feet should be kept dry, and wisely so," said he, "because, in his day, shoeing was not in vogue, and therefore the dry hoofs did not wear away so fast as if they were wet. We," added the Professor, "are required to do the very opposite thing, now that it is the custom to protect the hoof by means of an iron shoe, since its great strength, so desirable in the former case, would become the ruin of the organ under the ancient mode of treatment." Here we have one of more instances which could be adduced, where the truth shed by a great philosopher of old has been perverted to serve a false proposition. Now, I say, what was natural and true two thousand years ago, is natural and true now, and will continue so for all time.

Then as to what has falsely been regarded as scientific knowledge—what that was, as regards the formation and functions of the horse's foot, I have endeavoured to show; in almost every respect; indeed, if we try to make out laws, or a system of movements, then it will be found that the past teaching on the foot of the horse at our veterinary schools has stood in about the same relation to true interpretation as light does to darkness. Need I ask, if false conceptions on animal functions be imbibed, what will be the state of the understanding of altered conditions by the Veterinary Surgeon? what will be his state of knowledge of Pathology? and what about the pretence to apply shoes in such cases, as admit of the functions of the horse's feet being performed? I answer, that we might expect to find these questions answered, as we actually do, by experience. Success, or the absence of it, will be relative in practice to the ministering stock of knowledge whence the theory which rules, is derived.

What, in conclusion, then, can we in our small sphere do to amend the state of things here set forth? I dare say that you,



gentlemen, who I have the honour to address, are the only class of veterinary students in the kingdom who have heard the foregoing plain statements in a plain way; and I beg you to remember, that a man advised is half saved. It is in the power of young men to make themselves what they like, but they must go the right way about the work. To expect to become proficient in the practice of horse-shoeing, or in the diagnosis and treatment of disease and lameness, in the little time that can be devoted to such subjects, out of the two winter sessions, which is in accordance with what has now become an English custom, is only to court disappointment. Such feats, never have been done, and ought not to be looked for.

And I feel persuaded that it is better to look the truth fairly in the face than to run our heads into the hedge; we must keep a bold front to duty, and not depend on the chapter of accidents for professional success and social happiness in years to come. I think that I shall not startle any gentleman by exposing difficulties. On the contrary, I find that, to know what is required to be done, is the first step essential to the accomplishment of an object; and as regards the art of shoeing, and the management and treatment of the feet and legs of horses, these subjects will all become more simple to the understanding as they are correctly observed. Difficulty vanishes as knowledge advances; but there is no short and easy cut to the end; time, work, due appreciation of importance of, and love for the subject, are essential elements to the obtainment of success in the end.

---

*Physiology of the Pneumogastric Nerve in the Horse. Being an Extract from an Essay read before the Edinburgh Veterinary Medical Association, December 11th, 1863. By JAMES LAW.*

(Concluded from p. 23.)

*Superior Laryngeal Nerve.*—This nerve, when separated from the external laryngeal, has been found by Dr John Reid<sup>1</sup> and Chauveau<sup>2</sup> to have no influence whatever on the laryngeal muscles. Its distribution to the mucous membrane would lead to the inference that it is a centripetal or sensory nerve, and the result of experiment has established this conclusion. Before the time of Majendie, it was conceived that the superior and inferior laryngeal nerves furnished indiscriminately filaments to the laryngeal muscles, and after his experiments he advanced the doctrine that the superior supplied the muscles destined to close the glottis, while the inferior supplied those intended to dilate it. This is, however, quite erroneous. Dr John Reid<sup>3</sup> found that pinching of the superior laryngeal nerve with the forceps causes extreme suffering, while a similar application to

<sup>1</sup> Cycl. of Anat. and Phys.

<sup>2</sup> Journal de la Physiologie, April 1862.

<sup>3</sup> Edin. Med. and Surg. Journal, 1838.



the recurrent nerve had no such effect. Dr Reid further made an opening into the trachea, passed a probe into this tube, and pushed it up towards the larynx. Little effect was produced until it reached this last point, but then violent fits of coughing and signs of great uneasiness immediately followed. These were not in any measure relieved by cutting the recurrent nerves, but were immediately arrested by dividing the superior laryngeal nerves.

*Inferior Laryngeal or Recurrent Nerve.*—This nerve, as we have already seen by the experiments of Chauveau,<sup>1</sup> is a motor of all the laryngeal muscles except the crico-thyroid. Dr Marshall Hall and others had long before arrived at a conclusion exactly identical—viz., that the closing of the glottis, as a result of irritating the mucous membrane of the larynx is an excito-motor act, of which the superior laryngeal is the incident, and the inferior laryngeal the motor nerve. Some of these filaments are simply reflex or excito-motor, since the closing of the glottis is so rapid that no time is allowed for the intervention of the will. Others are sensifero-volitional, conveying to the mind the impression, and leaving the mind to control the movement of coughing calculated to remove the obstruction.

This motor-power of the recurrent nerves on the laryngeal muscles is of great importance in connection with the pathology of *roaring*. Legallois was the first to show that after cutting the recurrent nerves, the superior aperture of the larynx can no longer be dilated during inspiration. Dupuy, a French veterinarian,<sup>2</sup> cut the recurrent nerve on one side in a number of horses, and noticed that it invariably caused roaring. Subsequent observation has shown that the great majority of cases of roaring is dependent on paralysis of one of these nerves and consequent atrophy of the laryngeal muscles—especially of the crico-arytenoideus posticus, and the thyro-arytenoideus lateralis, the two principal dilator muscles of the arytenoid cartilages.

When the recurrences on both sides have been cut, the superior opening of the larynx is almost entirely closed, and, unless in old animals, in which the opening is relatively larger, and even in them, unless breathing is unnaturally slow, the subject rapidly dies from apnœa. In young subjects, in which the tissues are more lax and the opening smaller, the only chance of averting speedy death after cutting both recurrences, is the performance of tracheotomy. A few weeks ago, you will recollect that an animal which was being killed in the dissecting room suddenly fell down, affected by violent dyspnœa, as soon as a ligature was placed on the right carotid. Although none of us had any further proof of the matter, we could on the moment draw three almost certain inferences—1st, That the animal was a roarer; 2d, That the muscles were wasted on the left side; and 3d, That the right vagus or recurrent nerve, or

<sup>1</sup> P. 28.

<sup>2</sup> Recueil de Médecine Vétérinaire, 1826.



both, had been included in the ligature with the carotid artery. Dissection proved all these to be correct, and I now exhibit the larynx, with the wasted muscles on the left side far gone in fatty degeneration.

The influence upon the lungs of cutting the recurrent nerves I will notice later.

The recurrent nerves give small branches to the œsophagus, and these have been shown by the following experiments of Chauveau to be composed of centripetal or sensory fibres.

*Exp. 8th*, On an old horse in good condition, he cut the two vagi at the root of the neck, and afterwards supplied the horse with hay. It slowly masticated this hay, and carefully swallowed it, the œsophagus being meanwhile examined by the finger introduced into the wound made on the left side of the neck in order to cut the vagus. It was felt to contract powerfully, but, as it were, all at once, and not with the regular peristaltic movement of health. The aliments were felt to be arrested in front of the thorax, notwithstanding the violence of the contractions.

On offering water the animal took several mouthfuls, gave evidence of suffering, elevated the head, and on his depressing it, rejected the liquid through his nose.

He commenced to eat a second time, but soon became restless, and showed violent and rapidly increasing symptoms of dyspnœa. He ceased eating, and seemed in imminent danger of suffocation. Calmness was at once induced by tracheotomy, after which the animal fed as before. If made to swallow water, part escaped by the wound in the trachea.

The animal was killed by bleeding, and the stomach and gullet at once examined. In the former was found a quantity of hay taken before the water. The terminal part of the œsophagus was empty. In the tracheal part was a large amount of the pharyngeal mucus, and part of the hay swallowed after drinking.

*Exp. 9th*, In another case, after section of the two vagi, Chauveau proceeded to galvanise the cut ends of the left nerve by means of a feeble induction current. (a) Galvanising the peripheral end gave rise to contractions of the laryngeal muscles, but to no signs of pain or movement of the œsophagus. (b) Galvanising of the cranial portion with a weak current caused neither cough, efforts at vomition, movements of deglutition, contractions of the diaphragm, nor marked signs of pain. *But the œsophagus was violently and uniformly contracted through the whole cervical region.* Momentary relaxations of the organ took place at regular intervals. A stronger current led to cough, violent efforts at pharyngeal deglutition, forced inspirations, caused by the violent momentary contractions of the diaphragm, followed by a sudden arrest of expiration, during which there seemed efforts to vomit. The contractions in the cervical part of the œsophagus were violent, but the restlessness of the subject prevented them from being well marked.



The conclusion is unavoidable, that the vagi in the neck contain centripetal or incident fibres, which convey the impression from the œsophagean walls through the recurrents and pneumogastriks, and stimulate the nervous centre presiding over the act to transmit the requisite motor impulse. The arrest of the aliments in their œsophagean course is not dependent on any motor paralysis, but upon the absence of the natural reflex stimulus which calls forth the motor energy.

*Effects of the Laryngeal Nerves on Phonation.*—Galen,<sup>1</sup> Monroe,<sup>2</sup> Longet,<sup>3</sup> and others have noticed the enfeebling and loss of the voice dependent on cutting the recurrent nerves. Longet noticed that the voice is completely lost in old animals, while in the young a shrill unnatural sound may still be produced. Even this, however, is lost when the crico-thyroid is paralysed by cutting the external laryngeal nerve. Dr John Reid has seen partial aphonia in the human subject, resulting from compression of one recurrent by an aneurism within the chest. There can be no difficulty in attributing the aphonia to the paralysis of the muscles acting on the arytenoid cartilages and vocal cords.

Magendie,<sup>4</sup> Dupuytren,<sup>5</sup> and Longet<sup>6</sup> have noticed a hoarseness of the voice after cutting the two external laryngeal nerves, a result to be accounted for only on the supposition that sound is modified by the elongation and shortening of the tube of the larynx.

*Pulmonary Branches.*—Longet,<sup>7</sup> and Volkmann<sup>8</sup> have succeeded in inducing contractions of the bronchial muscles by stimulation of these branches of the vagus, and it is highly probable that the twigs furnished to the trachea by the recurrent nerves preside over the trachealis muscle in like manner.

The sense of anxiety due to the want of fresh air in the lungs (the *Lufthunger* of the German, and the *Besoin de respirer* of the French physiologists) has been attributed by Brachet,<sup>9</sup> Mr Grainger,<sup>10</sup> and others, to an impression conveyed from the lungs through the vagi to the medulla oblongata. The conclusion is come to on such facts as the following:—After the section of both vagi in the neck, the first struggles of asphyxia are followed by a diminution of the respirations to half their normal rythm, and they go on decreasing to death in ordinary cases. In younger animals, breathing is usually suspended at once. Mr Broughton<sup>11</sup> found that, after cutting the vagi in a horse, “the respirations became slow, twelve in a minute,” and in another horse, “the respirations fell to five in the minute.” Numerous experimenters have, on the other hand, found that respi-

<sup>1</sup> Haller's *Elementa Physiologia*, 1766.      <sup>2</sup> *Observations on the Nervous System*.

<sup>3</sup> *Rech. Exp. sur les Fonctions des Nerfs des Muscles du Larynx*, 1841.

<sup>4</sup> *Compendium of Physiology*, 1831.

<sup>5</sup> *Biblioth. Med.* 1807.

<sup>6</sup> *Op. cit.*

<sup>7</sup> *Op. cit.*, tom. ii. p. 289.

<sup>8</sup> Wagner's *Handvorterbuch der Physiologie*, art. Nerven Physiologie.

<sup>9</sup> *Système Nerveux ganglionaire*, p. 133.

<sup>10</sup> *On the Spinal Cord*.

<sup>11</sup> *Quarterly Journal of Literature, Science, &c*, vol. x. p. 305–307.



ration will go on for an almost indefinite time after both vagi have been divided, provided the ingress of air into the lungs is provided for. Some animals, doubtless, die even before the cessation of the struggles consequent on the division of the nerve, others linger one or more days, while some, and especially if air is freely admitted by performing tracheotomy, survive a month (Sédillot) or seven weeks (Löwinsohn). Dupuy<sup>1</sup> found that horses lived to the fifth, sixth, and seventh day, when care was taken to admit a sufficient quantity of air into the lungs.

Few will doubt that a large amount of this anxiety is due to an impression on the peripheral extremities of the vagi by the presence in the lungs of blood charged with carbonic acid; but at the same time the persistence of respiration, even after the section of the pneumogastric nerves, forcibly illustrates that this is not the only source of the anxiety, which in great part results from a general impression received through numerous nervous trunks from the circulation in all parts of the body of blood in a similar condition. It may even be questioned whether the origin of the vagus—the so-called vital point—or even the medulla oblongata itself, is absolutely essential to respiration. Dr Bennet Dowler, of New Orleans, has noticed respiratory movements in crocodiles after entire removal of the oblong medulla. Dr Brown-Séguard and Dr Boddaert have noticed the same thing frequently in birds, and Dr B. W. Richardson, of London, in new-born mammals. The chief difference in the movements is, that no expansion of the nares precedes the movements in the respiratory muscles of the body. Brown-Séguard accordingly concludes, and with great plausibility, that the medulla oblongata is not absolutely essential to respiratory movements, but that the removal of the vital point, or the transverse section of the spinal cord at the atlas, arrests respiration only by the violent excitement of the neighbouring parts, and the shock which the animal sustains.

The character of the respirations after the section of the vagi depend in no small degree on the poisoning of the whole system, and especially the nervous centres, by blood highly charged with carbonic acid. This in its turn depends on cutting, not of the vagus or its pulmonary branches, but rather of the recurrenents, which would close the larynx more or less completely.

The *morbid changes in the lungs*, after section of the vagi, consist chiefly in splenisation, the organs being in great part deep red, solid, and destitute of air. This is not congestion, but a condition dependent on a stasis of blood and a collapse of the air-cells. At certain points true congestion is met with, and in others there is actual inflammation and pulmonic effusion. The bronchia are filled by a frothy mucus, with in many parts a reddish tint. Dr Reid and others consider the splenisation due to the collapse of the air-cells, &c., and the stasis of the blood in the lungs consequent on the imperfect inspiration, and

---

<sup>1</sup> Jour. de Médecine, Chirurg. &c., tom. xxxvii. p. 356.



the predominance of carbonic acid in the circulating fluid. The inflammation is dependent on the stasis, and on the presence in the bronchia of portions of food and other irritants to which the paralysed larynx allows a free passage.

Dr Boddaert<sup>1</sup> has noticed that the inspirations are fuller than natural, though less frequent, and considers that the stasis is in no small degree dependent on the compression of the capillaries, and the diminution of their calibre consequent on distension of the air-cells. The small size of the capillaries in the lungs gives colour to this suggestion. The over-distension would likewise place the cell-walls in an abnormal condition, and, by diminishing their vitality, would further favour the inflammatory process.

There is no real ground for the supposition of some, that division of one vagus leads to disease in the corresponding lung. Dupuytren,<sup>2</sup> who cut one vagus in a horse and two dogs, found no pulmonary lesion in either after the lapse of a month.

Brachet,<sup>3</sup> Krimer,<sup>4</sup> and Longet<sup>5</sup> have concluded from numerous experiments, that the sensations caused by irritation of the mucous membrane of the bronchial tubes which usually precede coughing, are annihilated by dividing the vagi. Dr John Reid<sup>6</sup> argues that, if not entirely abolished, they are greatly blunted, so that the vagus may be considered as a nerve of common sensation to the bronchial mucous membrane. It is probable that the recurrent performs a similar office towards the tracheal mucous membrane.

*Cardiac Nerves.*—The influence exerted by the cardiac branches of the vagus on the heart has been very differently apprehended by physiologists. Valentin considered that he produced muscular contractions in the heart by irritating the trunk of the vagus. Moleschott<sup>7</sup> considers the vagus as a motor nerve of the heart, having found a feeble galvanic stimulus applied to it to increase the frequency of the beats of the heart by about  $\frac{2}{3}$  in rabbits, while a stronger stimulus more or less suddenly arrested its action by over-excitement. A continued strong current did not prevent the heart resuming its beats, but in this case the irritated part of the nerve had lost its vitality, and if the stimulus was applied at a lower point, the beats were once more suspended. In order to establish his theory, however, Moleschott has thought fit to deny a fact all but universally established among physiologists—viz., that cutting of the vagi constantly leads to increased frequency of the heart's beats.

Dr John Reid (*op. cit.*) has frequently galvanised the pneumogastriacs of animals immediately after death, without inducing stronger or more frequent contractions. Others consider that the

<sup>1</sup> Journal de la Physiologie, Oct. 1862.

<sup>2</sup> Biblioth. Méd., 1807.

<sup>3</sup> Système Nerveux ganglionaire, p. 157.

<sup>4</sup> Untersuchungen über den Husten.

<sup>5</sup> Anat. et Physiol. du Système Nerveux, tom. ii. p. 289.

<sup>6</sup> Cycl. of Anat. and Phys.

<sup>7</sup> Wiener Medicinische Wochenschrift, 24th May 1861.



vagus has a retarding power over the heart's action, and that it is from the absence of this that the number of beats increases after section of the vagi. In further support of this view, Brown-Séquard<sup>1</sup> brings forward the fact that a full inspiration has the effect of diminishing temporarily the beats of the heart. This had been previously noticed by Müller, Donders,<sup>2</sup> and Dr Mitchell,<sup>3</sup> and by them attributed to the mechanical compression of the heart between the dilated lungs. That this is not the true reason, is shown by the facts as pointed out by Brown-Séquard, that in cases of much irritability of the organ, its beats actually increase, and that, moreover, when the two vagi are cut, the inspiratory movement is accompanied by a greater frequency of the heart's beats. To throw further light on the subject, I transcribe one of many experiments undertaken by Brown-Séquard with the view of elucidating this point:—

*Exp. 10th.*—"In a newly-born kitten, two hours after opening the thorax (artificial respiration having been several times practised), inspiratory efforts being about once in 80", I counted in this space of time, and during each series of ten seconds commencing after an inspiratory effort—1st series, 5 pulsations; 2d, 6; 3d,  $7\frac{1}{4}$ ; 4th,  $7\frac{1}{2}$ ; 5th, 8; 6th, 8; 7th,  $8\frac{1}{2}$ ; 8th,  $8\frac{1}{2}$ ."

Experiments on ducks, geese, and pigeons gave similar results. Again, the division of the sympathetics in the neck does not prevent the diminution of the heart's beats coetaneously with inspiration. The whole goes to show that, at the same moment as the medulla oblongata transmits the nervous stimulus which leads to the contraction of the inspiratory muscles, an influence is likewise transmitted along the vagi nerves to the heart, which has a retarding power over the movements of that organ.

*Lower Œsophagean Nerves.*—The motor nerves of the post-cardiac part of the gullet in the horse are supplied directly by the terminal trunks of the pneumogastric nerves which lie on the upper and lower aspects of this organ. This is well shown by the experiments of Chauveau as given in pages 24–28 of the present essay. In certain cases this part of the gullet contracted after stimulation of the pharyngeal and external laryngeal nerves, and evidently only as a reflex movement, the stimulus of which was derived from the contraction of the tracheal portion of the viscus. In others of Chauveau's experiments, in which this nerve was cut in the neck, and the animal afterwards fed, the food collected in large quantities in the lower part of the gullet as the result of paralysis of its coats.

*Gastric Branches.*—The branches furnished to the stomach are motor nerves of that viscus. This has been satisfactorily established by the experiments of Bichat,<sup>4</sup> Tiedemann and Gmelin,<sup>5</sup> Longet

<sup>1</sup> Journal de la Physiologie, 1858. p. 517.

<sup>2</sup> Henle's and Pfeuffer's Zeitschrift.

<sup>3</sup> American Journal of the Med. Sciences.

<sup>4</sup> Anatomie Générale, tom. iii. p. 360.

<sup>5</sup> Recher. Experim. Physiol. et Chem. sur la Digestion.



(*opus. cit.*), and Dr Reid.<sup>1</sup> The experiments of Chauveau on the horse, already quoted page 25, substantiate these opinions. The movements, which are vermicular, usually pass from the cardiac to the pyloric orifices. Longet holds that movements of the stomach, due to irritation of the vagi, only take place when the stomach is engaged in chymification, and fail when the viscus is empty.

While it is thus certain that these nerves act on the stomach, it must not be therefore inferred that they are its only motor nerves. Magendie<sup>2</sup> and Dr Reid (*op. cit.*) have shown that these movements continue, though in a less marked degree, after section of the pneumogastrics.

It is now well established that they are little if at all interested in conveying to the nervous centres the sensation of hunger, which is dependent more on a certain condition of the system at large than on the simple vacuity of the stomach. On section of the vagi the sensation of hunger is at first lost, but, if the animal survives, it is ultimately restored.

It may be expected, *prima facie*, that the feeling of satiety is dependent on the full condition of the stomach, and is due to a sensation conveyed through the pneumogastric nerves. Dr John Reid<sup>3</sup> holds this opinion, and it would seem substantiated by the following experiments of Chauveau:—1st, Both vagi were cut in a young broken-winded horse without the performance of tracheotomy. The subject ate freely all day, and at night died asphyxiated. The gullet, from the pharynx downward, and the stomach, were enormously distended by finely chewed though very dry hay. 2d, A second horse had both vagi cut, and was then allowed to eat trefoil and straw *ad libitum*. Next day he was killed by bleeding, and the œsophagus and stomach found in the same distended condition as before. The latter was even more violently distended, and portions of food had found their way into the nares and trachea. There was not the slightest indication in either case of digestion going on.

That digestion may go on after division of the pneumogastric nerves is now conclusively established. Leuret and Lassaigne<sup>4</sup> divided both nerves in a horse, and found that digestion went on as before. Arnemann,<sup>5</sup> Sedillot,<sup>6</sup> Chaumet,<sup>7</sup> and Dr John Reid,<sup>8</sup> in their experiments on dogs, have met with similar results. Bernard's experiments, which seem to militate against this opinion, were made on animals not yet recovered from the shock of the operation, and are therefore open to fallacy. In one case, moreover, in which a dog lived seventeen days, he acknowledges that the contents of the

<sup>1</sup> Cycl. of Anat. and Phys.

<sup>2</sup> Comp. of Phys.

<sup>3</sup> Cyc. of Anat. and Phys.

<sup>4</sup> Leçons sur le Système Nerveux, tom. ii. p. 431.

<sup>5</sup> Zeitschrift für Wissenschaftliche Zoologie, vol. x. pp. 403–448.

<sup>6</sup> Recherch. Physiol. et Chem. pour servir à l'histoire de la Digestion, p. 133.

<sup>7</sup> Versuche über die Regeneration der Nerven, hundert und zehnter versuch., s. 99.

<sup>8</sup> Cycl. of Anat. and Phys.



stomach seemed digested, and that the lymphatics contained chyle. He, moreover, found that the section of the pneumogastrics behind the lungs did not interfere with the digestive process.<sup>1</sup>

The secretion of gastric juice, like the other digestive phenomena, is arrested for some time after cutting both pneumogastric nerves; but the testimony of many physiologists goes to show that it becomes re-established, if not in its former amount, yet in quantity sufficient to sustain life; and Dr John Reid remarks, that in one of his experiments "the animal was rapidly recovering flesh and strength, when he was killed three weeks after division of the vagi and re-currants, with loss of substance." The secretion of mucus from the mucous membrane of the stomach and intestines, and the absorption from the former organ, seem little affected by cutting the vagi. Dupuy introduced powdered nux vomica into the stomachs of horses after cutting the vagi, and concluded, from the slow access of symptoms of poisoning, that absorption went on with greatly decreased rapidity. It is now established, however, that such agents are not absorbed from the stomach of the horse even in health; and the late onset of poisoning is therefore to be ascribed to the simple retention of the agent in an inactive viscus.

Bernard<sup>2</sup> considers that the hepatic branches control in great measure the secretion of the liver. The division of the vagi he found to arrest the secretions of the organ, and the galvanisation of its trunk to lead to the presence of sugar in the blood and urine, or to its increase, if already present; it likewise alters the characters of the urine, rendering it more limpid and less alkaline.

Herr J. Kollman<sup>3</sup> gives an account of the distribution of these nerves, not only to the liver, but to the spleen, kidneys, suprarenal capsules, pancreas, and small intestines, but our present knowledge of their influence on these organs is too limited to warrant us in making remarks upon it.

In certain cases this nerve acts co-ordinately with others in the performance of different functions. Among these may be particularly noticed, respiration, deglutition, and vomiting,—the last a rare occurrence in the horse. Each of these is a reflex nervous action, in which a stimulus is conveyed to the medulla oblongata through certain afferent nerves, and a corresponding motor stimulus, conveyed through certain other efferent nerves to the same, or other parts of the system.

The co-ordination of movement in the different parts in such cases, is due, according to Van der Kolk,<sup>4</sup> to the intimate communication, by means of nervous fibres, between the centres presiding over the different motor nerves, or through means of secondary or remote centres, which are common to all the nerves implicated. Thus the central nuclei of the motor nerves in the medulla oblongata are placed near

<sup>1</sup> Thèse au Nerf Pneumogastric.

<sup>2</sup> Essai sur la Physiol. de l'Estomac.

<sup>3</sup> *Opus cit.*, tom. ii. p. 456.

<sup>4</sup> Spinal Cord and Medulla Oblongata, p. 200.



the median line, while those of the sensory nerves are situated more laterally, but these are more or less intimately connected by intervening fibres, according to the mutual dependence of the functions; and not only so, but the nuclei on the two sides are closely connected in a similar manner, by which a synchronous bilateral movement is ensured. This latter provision is in the highest degree essential, alike in breathing, swallowing, and vomiting.

In *respiration*, the stimulus is conveyed to the oblong medulla through the vagi and other incident nerves throughout the body. The resulting motor stimulus is distributed simultaneously through the facial to the nares, the pneumogastric and recurrent to the larynx, the phrenic to the diaphragm, and the intercostal to the lateral walls of the thorax. These acting in unison, and on both sides, lead to a perfect inspiration. It seems probable, however, as already noticed, that all the motor power is not generated in the oblong medulla, and that it is not even necessary that the impulse be received through the latter structure; but, at the same time, the independent centres in the spinal cord have a sufficiently intimate connection with those in the medulla oblongata to ensure a perfect harmony in action.

In *deglutition*, we have the palatine branch of the trifacial as an afferent nerve, and more posteriorly the branches of the pneumogastric; while as efferent or motor nerves we have the facial acting to close the jaws, the hypoglossal moving the tongue, and the different branches of the vagus for the contractions of the œsophagus. The connecting twig between the vagus and facial probably assists in the co-ordination of movement; but Van der Kolk likewise finds in the inferior olivary body a common centre for the nerves engaged in swallowing, this nucleus being intimately connected with their respective roots, and with its fellow on the opposite side, for the proper co-ordination of movements. It is further connected, moreover, with the cerebrum by direct nervous filaments, so that swallowing can be effected as a voluntary act, even after the afferent nerves have been divided. At the same time, it seems certain that the motor power for the lower part of the gullet is called into exercise at a later date, by incident fibres of the pneumogastriæ, and is not affected by the stimulus derived from the inferior olivary body, and that, moreover, without this secondary stimulus the gullet would remain quiescent, and become blocked up with aliments.

*Vomiting*, when not occurring from some cerebral derangement, is likewise a reflex action. In this case the afferent impulse is conveyed to the medulla oblongata through the sensory nerves of the fauces, or, in case of its arising from abdominal derangement, through the vagi; and from the medullary centre the reflex motor power is transmitted through the facial nerves to open the jaws, through the spinal accessory, vagi, and recurrenents to close the larynx, through the pneumogastriæ to induce contractions in the stomach, and through all the expiratory muscles to the trunk.

The intimate connection between the respiratory and digestive



organs, through the medium of the vagus, affords a tolerably satisfactory clue to the prevalence of broken-wind among horses in certain circumstances. This is invariably associated with, and is very commonly dependent on, derangement of the digestive organs, and general impairment of the functions of this nerve—soon resulting in, and becoming aggravated by, morbid changes within the lungs themselves. Broken wind, we are all aware, prevails most where least attention is paid to the animal's feeding. A stomach habitually gorged with dry and innutritive fodder, especially if the possessor is put to fast work or severe draught immediately on its being replenished, is almost certain to entail upon its unfortunate owner the malady just referred to. In the same way may be accounted for the cough which is sometimes met with in young horses as a symptom of worms in the intestinal canal, as well as the constant aggravation of heart disease from overloading of the stomach, or after indigestible articles of food have been partaken of.

*Résumé.*—I will endeavour to summarise, in the fewest words possible, what has been ascertained on the functions of this nerve:—

1st, Besides many afferent, the vagus contains a large number of efferent or motor filaments as it emerges from the medulla oblongata.

2d, The filaments of the spinal accessory branch are motor, and preside over those movements of the larynx that determine the production and pitch of the voice.

3d, The auricular branch is exclusively afferent and sensory.

4th, The pharyngeal nerve is principally, if not entirely, motor, and acts on the pharynx and tracheal part of the oesophagus in obedience to impressions received through the afferent filaments of the trifacial—probably the glossopharyngeal—and the recurrent nerves.

5th, The superior laryngeal is entirely sensory and afferent, conveying from its point of distribution in the mucous membrane of the larynx that impression which determines coughing.

6th, The external laryngeal nerve is the motor of the crico-thyroideus, posterior pharyngeal constrictor, and cervical portion of the gullet.

7th, The inferior laryngeal or recurrent nerve contains motor fibres for the cervical part of the trachealis muscle, and for all the laryngeal muscles except the crico-thyroideus. It contains also sensory filaments for the trachea and tracheal portion of the gullet. When cut it leads to sensory paralysis in the tracheal part of the gullet and the trachea, and motor paralysis in the larynx, with aphonia. In closing the larynx, as for coughing, it acts under a force determined by an afferent influence, conveyed to the medulla oblongata from the laryngeal mucous membrane, through the superior laryngeal nerve. The same result may follow an impression conveyed to the oblong medulla from any part of the respiratory mucous membrane situated behind the larynx. In opening the larynx for inspiration, it acts involuntarily under the influence of



the general demand for fresh air (*Besoin de respirer*) conveyed to the medulla oblongata through the vagus and other nerves.

The imperfect opening of the orifice between the arytenoid cartilages, when one recurrent has been cut or paralyzed, impedes the ingress of air into the lungs, and produces *roaring*.

If both recurrences are cut or paralyzed, the animal usually rapidly perishes by suffocation.

8th, The pulmonary branches contain afferent fibres, which are capable of producing respiratory muscular movements through an impression made on the medulla oblongata. They likewise convey an impression provocative of coughing, in cases of irritation of the bronchial mucous membrane. They seem also to contain efferent or motor fibres, which preside over the muscular contractions of the bronchial tubes.

9th, The influence of the cardiac branches over the muscular movements of the heart is not well understood. That they contain motor filaments has not been satisfactorily established; while, on the other hand, they seem to possess a power of controlling cardiac movement, inasmuch as during and after inspiration the heart's beats are reduced in number, by means of an influence conveyed through the vagus nerve from the medulla oblongata.

10th, The œsophagean twigs behind the heart contain both afferent and efferent fibres, which respectively convey the sensory impressions to the medulla oblongata, and the motor from that structure back to the gullet.

11th, The gastric branches contain motor fibres for the movement of the stomach, though, even when they are cut, that viscus may perform normal movements, under the control of the sympathetic. They contain, besides, afferent fibres, to which the feeling of satiety, and other sensations dependent on the condition of the stomach, are owing, and on which, in vomiting animals, depends nausea resulting from a disordered stomach.

12th, Of the hepatic and other divisions of this nerve, we know only that, in the hands of Bernard, the stimulation of the vagus led to the presence of sugar in the blood and urine; and that the latter secretion became more clear and less alkaline.

---

### *Import of Foreign Stock into England.*

DURING the last two months increased supplies of foreign stock have been imported into England, when compared with the three previous years. The importations into London amounted to 9907 beasts, 32,232 sheep, 3087 calves, and 828 pigs, or a total of 46,054 head. In the corresponding period in 1862-3, the aggregate arrivals were about 37,500, and in 1861-2, 30,400 head. It will be perceived, therefore, that the influx from the Continent still continues to increase, notwithstanding the prevalence of disease in Germany



and various other quarters. At the outports, such as Harwich, Southampton, &c., the arrivals have been very moderate. As regards the general condition of the stock received, we may observe that it has shown signs of farther improvement. Many of the Dutch sheep have come to hand of first-rate quality, so good, indeed, that some of them have been taken for west-end consumption. The breeders have wisely shortened their legs by means of crossing with English Down and Gloucester sheep. Strict attention has been paid to the length of tail, so that Holland promises at no distant day to rival, perhaps excel, us, in our own markets. That this is not a far-fetched notion may be inferred, from the circumstance that, with very few exceptions, the Dutch sheep carry a much larger quantity of internal fat than the usual breeds in this country; hence, they have become great favourites with the butchers, and commanded very high prices. Within the last month sales have been effected in the metropolitan market at 62s. each. The sheep from Germany, however, have shown very few signs of improvement, and they have been forced off at rates varying from 19s. to 32s. each.

We have very little improvement to notice in the quality of the beasts at hand. Those from the north of Europe have "died" tolerably well, and they have fairly met consumption in some of our poor localities. They have changed hands at from L.17 to L.24, 10s. each. Some remarkably fine-looking Spanish bullocks have been received, and some of them have realised L.27, 10s. each; but they have turned out not only a very midling carcase as regards weight, but they have carried very little loose fat. They have therefore been unprofitable to the buyers. From the circumstance that France is still drawing heavily upon the supplies of stock produced in Spain, we can scarcely anticipate any increase in the imports from the latter country, more especially as the freights to England are high, compared with the value of the stock on arrival. During a recent tour in France, we were struck with surprise at the limited supplies of both beasts and sheep, even in the best portions of the country. The people themselves are not large consumers of animal flesh; nevertheless, it was necessary, last year, to import fully 700,000 head of each kind of stock—about 500,000 head being sheep—to meet the demand. This immense supply was chiefly derived from Spain, Holland and Germany. We have been accustomed to regard our own importations as extensive; but what are they compared with the necessities of France? The production of grain and beet-root in each department is wonderfully large; still, the want of adequate supplies of stock operate seriously upon the general commerce of the country, which too frequently suffers from a rapid outflow of the precious metals to pay for food.

The stock recently imported from Holland and other parts of the Continent has exhibited very few traces of disease. Fortunately it has been subject to a very close inspection on arrival, and in this way our own flocks and herds have escaped contamination. We



believe, however, that during the last three or four months, the losses in Holland and Germany have been small, compared with some former periods. Our own supplies, especially the beasts, have made their appearance in really fine condition, and have changed hands at remunerative prices. The best Scots and crosses have realised fully 5s., and the best Downs, 6s. per 8 lbs. Our accounts from most parts of England state that both beasts and sheep have done remarkably well, and that the supply of food on hand for winter use is a full average, and of good quality. The general impression is, however, that meat will rule very high in price for some time, owing to the enormous consumption. The annexed return shows the imports of foreign stock into London during the last two months :—

## IMPORTS OF FOREIGN STOCK.

From	Beasts.	Sheep.	Calves.	Pigs.
Amsterdam, . . .	11	318	—	—
Antwerp, . . .	13	162	186	—
Boulogne, . . .	—	16	—	45
Bremen, . . .	64	5	—	—
Calais, . . .	—	—	65	173
Dordt, . . .	582	1,636	—	—
Hamburg, . . .	166	3,916	24	206
Harlingen, . . .	2,754	5,056	190	121
Medemblik, . . .	247	6,234	18	—
Oporto, . . .	60	—	—	—
Ostend, . . .	109	933	421	54
Rotterdam, . . .	3,730	12,520	2,183	229
Schevening, . . .	201	234	—	—
Tonning, . . .	1,711	1,202	—	—
Vigo, . . .	259	—	—	—
Total,	9,907	32,232	3,087	828

From the above table, it will be seen that the principal shipments were made from Harlingen, Rotterdam, Medemblik, and Tonning. The arrivals from Portugal were only 60, and from Spain 259 head. From those quarters, however, we cannot anticipate any important increase in the receipts.



## REPRINT OF REMARKABLE MEMOIRS.

—o—

*Contributions to the Chemistry and Physiology of Fœtal Nutrition, Being an Inaugural Thesis to which the Medical Faculty of the University of Edinburgh awarded a gold medal in 1862. By ARTHUR GAMGEE, M.D., late Senior President of the Royal Medical Society, Edinburgh, late Resident Physician in the Royal Infirmary, and Assistant to the Professor of Medical Jurisprudence in the University of Edinburgh.*

PART I. *On the Chemistry and Physiology of the Milky Fluid found in the Placental Cotyledons of Ruminants.*

THERE are few subjects more worthy of study, or which offer more interest to the physiologist, than an inquiry into the chemical changes which take place in the placenta. Whether certain portions of the maternal blood percolate unaltered into the fœtal capillaries, or whether the maternal portion of the placenta elaborates a nutrient material, which is afterwards absorbed by the fœtal portion of the organ, is one of the most interesting questions which present themselves in such an inquiry, and it is with the hope that I may supply some of the data which are required for answering this question, that I am led to publish the observations which I have made.

The attention of naturalists and physiologists has long been directed to the milky fluid which can be seen in the placenta of some of the lower animals, and more especially to that which is found in the placental cotyledons of the ruminantia.

In this order, the villi of the chorion become developed in patches all over its surface, and these villi, dipping into the mucous follicles of the uterus, give rise to those rounded or oval bodies which have been named cotyledons, and which must be regarded as small placenta. These cotyledons, which differ in number, size, weight, &c., in the different members belonging to the order, can be easily divided into a fœtal and maternal portion. The fœtal portion, which is of a deep red colour, is seen to consist of the villi of the chorion beautifully developed; the maternal portion, which is usually very white, consists of the hypertrophied uterine mucous membrane, and is covered with the openings of the much-enlarged mucous follicles, on squeezing which a considerable quantity of a creamy fluid escapes. I may add that, by exerting gentle pressure, the fœtal can be readily separated from the maternal portion of the cotyledon, without causing the rupture of any vessels.

Before considering in detail the chemical characters of the fluid found in the cotyledons, I shall quote the opinions which have been entertained regarding its origin and nature.



Duverney<sup>1</sup> considered the maternal portions of the cotyledons to be true glands, whose function it is to separate a juice which the placenta absorbs for the nutrition of the foetus.

Eschricht described the cotyledonary fluid of ruminants as a white, thickish fluid, secreted by the utricular glands (mucous follicles), and which is absorbed by the blood-vessels of the chorion.

Prevost and Morin<sup>2</sup> first examined this fluid. They arrived at the conclusion that it contains albumen, fibrin, casein, a gelatinous substance, blood-colouring matter, osmazome, fat, and salts. They made a quantitative analysis of the secretion, which agrees in the main with the results obtained by Schlossberger and myself. This will be found at the end of this paper, below the table of analysis made by Schlossberger and myself.

Professor Schlossberger, of Tübingen, published in 1855, in No. 96 of the "*Annalen der Chemie und Pharmacie*," a short paper, entitled "*Die Uterinmilch der Wiederkauer*." In this paper Schlossberger gave the first correct account of the chemistry of the fluid. He described the result of the examination of four specimens of uterine milk of the cow, and performed a quantitative analysis of two of these specimens, of which he gave the results, and I may here state that I shall frequently make use of the name which Schlossberger first gave to the fluid. The results of Schlossberger's researches were the following: Uterine milk is a fluid of creamy consistence, exhibiting, when examined microscopically, many free nuclei, fat-globules, and epithelial cells. It has a decidedly acid reaction, and contains albumen, fat, and salts, but no sugar. Schlossberger did not direct his investigations particularly to determine whether the fluid contained casein or not, nor did he in any way determine the amount which can be obtained from the cotyledons. I may incidentally state that my investigations were carried on quite independently of anything that had been written by the German chemist, as, when I undertook the examination of the fluid I was not aware of it having been examined by any one. Schlossberger's paper only became known to me after I had completed my second quantitative analysis.

Colin<sup>3</sup> considers the cotyledonary fluid to be simply the product of decomposition, and that it therefore does not exist during life. He says that it can only be obtained from the cotyledons a considerable time after death, the period varying with the temperature and other concomitant circumstances. To this assertion of Colin I think myself entitled to give an unqualified denial. I repeatedly obtained the uterine milk which I examined from uteri which had been so recently removed from slaughtered animals that they were still warm, though my experiments were conducted in the middle of

<sup>1</sup> Œuvres Anatomiques, tom. i. p. 530.

<sup>2</sup> Mem. de la Société Phs. d'Hist. Nat. de Genève, tom. ix.

<sup>3</sup> Traité de Physiologie comparée des Animaux Domestiques, p. 600.



winter. Thus my first quantitative analysis of uterine milk was of a specimen obtained from the cotyledons within six hours of the death of the cow. The quantity obtained from 1000 grains of the maternal portions of the cotyledons was 149·8 grains. Surely this could not be the product of decomposition, especially when we take into consideration the fact that the temperature happened to be below 32° Fahr.

*On the Process adopted to obtain the Cotyledonary Fluid, used in my Experiments.*—I obtained the fluid by squeezing firmly the maternal portions of the cotyledons, enveloped in calico. I employed my fingers to express the fluid, as I found that by this means alone I could regulate the pressure to be exerted. I found that if the cotyledons were not fresh, or if too much force was used in squeezing, the tissue became reduced to a pulp, which became mixed with the uterine milk. I never succeeded in obtaining all the uterine milk present in the cotyledon, for, firstly, a considerable quantity was lost on the calico in which the cotyledons were enveloped; secondly, a force sufficient to express all the fluid could not be exerted without reducing the tissue of the cotyledon to a pulp, which, becoming mixed with the uterine milk, would have vitiated the results of the experiments; thirdly, some of the uterine milk remains adherent to the foetal portion of the cotyledons, from which it cannot be removed, unless mixed with blood in considerable quantity.

With the means at our disposal for obtaining uterine milk, it must be evident that some of the cellular structures of the cotyledons must be inevitably mixed with it. The results obtained by Schlossberger and myself show it to have, however, a tolerably uniform composition.

*On the Physical and Chemical Properties of the Fluid found in the Cotyledons.*—The fluid obtained by expression from the maternal portion of the cotyledons is of a white or rosy-white colour, and of creamy consistence.

The *specific gravity*, as ascertained by means of the bottle at 60° Fahr., of two specimens obtained from the cow, was 1033 and 1040. I found the specific gravity of two specimens of the fluid from the cotyledons of the cow to be 1033 and 1031.

When examined *microscopically*, the fluid exhibits an abundant molecular basis, in which float numerous fat-globules and epithelial cells. Many of these cells possess a highly granular and fatty appearance, and contain nuclei which are brought out by the action of acetic acid. The majority of the cells are *evidently* the spheroidal cells of the mucous follicles, which have undergone a fatty change.

*Reaction.*—With only one exception, I found the uterine milk of the cow and of the ewe to have an alkaline reaction, when fresh, becoming very decidedly acid as soon as putrefaction set in. In the one exceptional case to which I have referred, the reaction was neutral. In this respect my results differ from those of Schloss-



berger, who, speaking of the reaction, says ; “Das secret war geruchlos und reagirte in allen vier Fallen deutlich wenn auch schwach sauer. Ich wurde dadurch an die häufig saure Reaction der Kuhmilch erinnert,” &c.

When the fluid obtained from the cotyledons is heated, we notice the formation of a pellicle over its surface, as when milk is boiled. (Such a pellicle was formerly always supposed to indicate the presence of casein in the fluid in which it occurred.) The liquid then solidifies, from the coagulation of the large quantity of albumen which it contains, and which is readily detected by all the tests for that substance. When evaporated to dryness, uterine milk leaves a brownish brittle residue, the colour of which depends very greatly upon the amount of heat which has been employed in the process of evaporation. If the dried residue be pulverized and treated with boiling ether, this dissolves out a certain amount of fat.

The amount of solid matter present in the uterine milk of the cow appears to vary from 9·63 to 11·65 per cent. In two analyses of the uterine milk of the ewe, I found the solids to amount to 11·70 and 8·12 in 100 parts.

The quantity of fatty matter in one specimen from the cow was 1·23, in another 1·40 per cent. In two specimens of the uterine milk of the ewe, I found the quantity to be 1·05 and 1·20 in 100 parts.

If the dried residue, which has been treated with ether, be burned in a crucible at a red heat, a very small amount of ash will be left. This I found to amount to ·37 and ·48 in 100 parts of the uterine milk of the cow, to ·47 and ·82 in that of the ewe. The quantity of the ash is so small, and my time has been so fully occupied, as not to enable me to examine it carefully.

Different portions of uterine milk were repeatedly tested for sugar, but none was found.

In order to determine the presence or absence of casein and albumen, I followed the following processes :—

I diluted some uterine milk with an equal bulk of water, and boiled it ; an abundant coagulum was formed. On attempting to filter the fluid, so as to separate it completely from the coagulum, the process was soon arrested by the clogging of the filter. I therefore added a few drops of acetic acid to another specimen of diluted uterine milk, when, after boiling, I found that the precipitate separated quite readily, and admitted of rapid filtration. Other specimens of uterine milk were precipitated by nitric acid and the other reagents which indicate the presence of albumen. Having diluted a considerable quantity of uterine milk, I added a solution of chloride of ammonium, in amount more than sufficient to render the fluid neutral ; I then boiled it for a few minutes, and filtered. The filtrate, which was quite clear, was divided into several portions. To one I added acetic acid ; it caused a curdy precipitate. To another I added a solution of chloride of calcium ; no precipitate occurred. To another portion I added a solution of sulphate of magnesia ; the fluid



remained clear. A precipitate was, however, formed when the fluid was boiled.

The above reactions would formerly have been considered ample proofs of the presence of casein, especially when taken in connection with the film which formed on heating the fluid. We are now aware, however, that albumen, if held in solution by potash and soda (the so-called albuminates of potash and soda), reacts in all these particulars like casein. I therefore added to another portion of the clear filtrate some rennet, and placed it over a fireplace, where the temperature was about 100° Fahr. No coagulum formed. I repeated all the above experiments several times, with precisely the same results. They prove that uterine milk contains no casein, but that some of its albumen is held in solution by alkalies. In my quantitative analysis, I estimated separately the albumen precipitated by heat and that precipitated by acetic acid.

*On the Quantitative Analysis of Uterine Milk.*—1. A quantity of the fluid, varying from 200 to 600 grs., was evaporated to dryness in a porcelain capsule. The evaporation was carried on first in the hot-water oven, secondly in the hot-air oven, at a temperature of 220° Fahr.; and lastly, the residue was allowed to cool in a bell-jar over sulphuric acid, and then weighed. By this means the amount of *water* and *solids* was ascertained.

2. The dry residue of (1) was pulverized and treated with successive portions of boiling ether. The ethereal solution was allowed to evaporate spontaneously, then heated gently in the water-oven, and weighed. Thus was found the amount of *fatty matters*.

3. The residue of (2) was incinerated until the organic matter was quite burned away, leaving a white ash, which was weighed. Thus was obtained the quantity of the *inorganic salts*.

4. About 300 grs. of uterine milk were accurately weighed and diluted with an equal bulk of water, and a considerable quantity of a saturated solution of chloride of ammonium was added. The liquid was then boiled for some time. The coagulum was then collected in a counterpoised filter, and dried in the water-oven. It was then cut into very small pieces with a knife, and these were further dried in the hot-air oven, and lastly weighed. The weight, minus that of the filter-paper, gave the amount of *albumen*, which carried down with it the cellular structures present in the fluid.

5. To the filtrate obtained in operation 4, acetic acid was added; the curdy precipitate was collected on a counterpoised filter, and the drying and weighing carried on as described above.

This plan of analysis, it will be observed, is not an absolutely accurate one. In the first place, the albumen cannot be obtained free from the cellular elements present in the fluid obtained from the cotyledons. Secondly, in order to save time, the precipitate of albumen was not incinerated after being dried, so that there must be a slight error in excess in the amount of albumen.

*Analysis of Uterine Milk of the Cow, No. 1.*—The amount which



could be obtained from the cotyledons was not ascertained. The reaction of the fluid was slightly alkaline. The density of 60° Fahr. was 1033.

Water in 1000 parts . . . . .	879·10
Solids . . . . .	120·90
Albumen with cellular structures . . . . .	104·00
Alkaline albuminates . . . . .	1·60
Fat . . . . .	12·33
Inorganic salts . . . . .	3·74

*Note.*—The amount of solids ascertained separately exceed by ·77 the aggregate solids determined by evaporating the fluid.

*Analysis of Uterine Milk of the Cow, No. 2.*—This specimen was obtained from the cotyledons of a cow at an advanced period of gestation. The following observations were made upon the number and weight of the cotyledons, and upon the quantity of the fluid yielded by 1000 grs. of the maternal portion of the cotyledons. The cotyledons were 90 in number.

	Grains.
The aggregate weight of the cotyledons was . . . . .	44,780
„ maternal portions of the cotyledons weighed . . . . .	20,090
„ foetal do. do. . . . .	24,690
„ largest cotyledon . . . . .	1,315
„ smallest . . . . .	105·5
„ quantity of uterine milk which could be squeezed from 1000 grains of the maternal portion of the cotyledon was . . . . .	149·8
Quantity of cotyledonary fluid, which could at this rate be expressed from the whole of the maternal portions of the cotyledons, estimated at . . . . .	3,009·48

The following are the results of the analysis of this specimen :—

Specific gravity at 60° Fahr. . . . .	1040
Reaction . . . . .	neutral.
Water in 1000 parts . . . . .	861·2
Solids . . . . .	138·8
Albumen and cellular structures . . . . .	116·5
Alkaline albuminates . . . . .	3·3
Fat . . . . .	14·0
Salts . . . . .	4·0
Loss . . . . .	1·0

Having estimated the amount of the fluid which was yielded by a given weight of the cotyledons, and having calculated from this the amount that could have been expressed from the whole of the maternal portions of the cotyledons, we can calculate how much of the separate constituents would be found in the whole quantity of the uterine milk.

	Grains.
Water in 3009·48 grains of uterine milk . . . . .	2591·74
Solids . . . . .	417·74
Albumen and cellular structures . . . . .	350·60
Alkaline albuminates . . . . .	9·93
Fat . . . . .	42·13
Salts . . . . .	12·00



*Analysis of Uterine Milk of Ewe, No. 1—Reaction Alkaline.*

Specific gravity . . . . .	10·31
Water in 100 parts . . . . .	88·30
Solids . . . . .	11·70
Fat . . . . .	1·20
Albumen with cellular structures . . . . .	9·50
Alkaline albuminates . . . . .	·47
Salts . . . . .	·45

The uterus in this case contained a lamb weighing 9½ oz.

*Analysis of Uterine Milk of Ewe, No. 2,*

Weight of uterus and membranes . . . . .	2 lbs. 14 oz.
„ of lamb contained . . . . .	1 „ 3 „
Uterine milk expressed from the maternal portions of all the cotyledons . . . . .	544·5 grs.
Specific gravity of uterine milk . . . . .	10·33
Water in 100 parts . . . . .	91·88
Solids . . . . .	8·12
Fat . . . . .	1·05
Albumen, with cellular structures and alkaline albu- minates . . . . .	6·12
Salts . . . . .	·82

In this case a considerable quantity of mucus existed between the chorion and mucous membrane of the uterus, external to the cotyledons.

Having given the results of my researches on the composition of the so-called uterine milk of ruminants, I would direct attention to the fact that, in other orders of animals, a fluid is found between the chorion and uterine mucous membrane, which in physical characters appears to resemble it. In the sow I have found such a fluid. In one case I collected a considerable quantity of a milky fluid (737·5 grs.), which was situated between the mucous membrane of the uterus and the chorion. It had an alkaline reaction; its density was 1017; it was highly coagulable, and contained fat. As it was beginning to decompose, I did not make a quantitative analysis of it. My brother has also informed me that, in his dissections of the uterus of pregnant mares, he has noticed a considerable quantity of a creamy fluid between the chorion and the uterine mucous membrane.

Without wishing to draw rash conclusions from the few facts which I have adduced, I would remark that they appear to be of some importance; that they seem to bear out the views of those who believe that the placenta contains arrangements which separate those constituents of the blood which are requisite for the nutrition of the fœtus, and that they give support to those anatomists who attribute such a function to the external and internal cells of the villi of the human placenta.\* It is a subject in which, however, further re-

---

\* See Professor Goodsir's paper "On the Structure of the Human Placenta," in his *Anatomical and Pathological Observations*. Edinburgh, 1845.



searches are much wanted, and to which I hope to revert, when I shall have had opportunities and leisure to study more fully the chemical composition, and especially the microscopic character of the interesting fluid which forms the subject of this paper. For the convenience of reference, I have annexed a table in which the results of analysis of uterine milk, made by Schlossberger and myself, may be seen and compared. To be more complete, I have added below the results of Prevost and Morin's analysis.

*Tabular View of Analyses of Uterine Milk.*

	Schlossberger.				Arthur Gamgee.						
	I.		II.		III.		IV.		V.		VI.
Reaction . . . . .	Acid	...	Acid	...	Alkaline	...	Neutral	...	Alkaline	...	Alkaline
Specific gravity . . . . .	—	...	—	...	1033	...	1840	...	1031	...	1033
Water . . . . .	88·07	...	88·03	...	87·91	...	86·12	...	88·30	...	91·88
Solids . . . . .	11·93	...	11·97	...	12·09	...	13·88	...	11·70	...	8·12
Fat . . . . .	1·59	...	1·52	...	1·23	...	1·40	...	1·20	...	1·05
Albumen with cellular structures . . . . .	9·63	...	9·57	...	10·40	...	11·65	...	9·50	...	6·12
Alkaline albuminates . . . . .	—	...	—	...	0·16	...	·3	...	·47	...	—
Salts . . . . .	0·71	...	0·70	...	0·37	...	·40	...	·45	...	·82
Of the Cow.						Of the Ewe.					

*Analysis of the Uterine Milk of the Cow by Prevost and Morin.*

Water in 100 parts . . . . .	86·837
Solids . . . . .	13·163
Albumen, fibrine, &c. . . . .	11·028
Gelatiniform matter . . . . .	0·546
Osmazome . . . . .	0·714
Fat . . . . .	0·750
Salts undetermined.	

(To be continued.)



# EDINBURGH VETERINARY REVIEW

AND

## Annals of Comparative Pathology.

---

### HORSE-BREEDING FOR THE TURF IN SCOTLAND.

IN another place will be found a paper signed "Iconoclast," reproduced at length from "Bell's Life," on "The Turf and the Scotch."

The author, who has gone deeply into the subject, has coupled the sport of flat-racing, hurdle, and hunters' stakes' competitions under the same heading—and probably with due consistency, since these are closely allied in many respects.

The subject of breeding blood-horses in Scotland, being also discussed by "Iconoclast," we are induced to make a few remarks thereon. Having nothing to add, or exception to take, on all that has been advanced on the question of sport, with its exhilarating advantages, we join the writer in wishing a larger share of popularity to racing in Scotland, and in the meantime beg to offer a few remarks on that part of the subject which we have looked into more analytically—*i. e.*, Breeding. Our views would lead us to keep the two questions distinct, viz., that of breeding blood-stock in Scotland, and the legitimate sport and allied interests derivable from racing.

Breeding of blood-horses in the United Kingdom is a subject for consideration which may fairly be submitted to the laws of economy, since no fear need be entertained of there being a dearth of numbers in that class of horse. Rational methods of cultivating the breed, the best means at command, and the cost of producing the right sort of horse, are questions of first importance to be discussed.

We start with some evidence which goes to show that breeding of blood-stock answers better south than north of the Tweed; and in the first place, it may be remarked, that amongst the staunchest patrons of the English turf have always been found conspicuous some of the noblemen and gentlemen of Scotland; and so far as our memory serves us, all who have bred blood-horses to any notable extent have kept their studs, as well as their training establishments, in England, even though in some exceptional cases they have had no landed property there suitable for the purpose. In these cases we find that gentlemen have either by purchase or hire provided the required accommodation; here then we have a point to start from, with facts to guide us.

Our own opinion is, that breeding of blood-stock in Scotland is in no way essential to the obtainment of good racing there; nor can we see any prospect of its giving an equivalent return, even if talent and capital were embarked in the speculation there as extensively as they are in England.

Breeders in Scotland would find no small disadvantage from their stock lying far out of the centre of business, which, taking the boundary of the chief race-horse producing counties of the kingdom to be the Tyne in the north, and the extreme south on the other hand, it would be found that the owner of a stud of mares in the centre of Scotland would have to send them 300 miles, on an average, to secure the services of the best suitable stallions that might annually be selected. This is assuming that the object would be to produce a higher standard of merit in the stock than can be bought; otherwise there would be no reason for such an undertaking, since there is no want in the number, of blood-horses.

Then, the relative high expense and risk that would be found in the above instance would meet the Scottish breeder everywhere. The sale of young stock and the opportunities for buying would be attended with great expense and other disadvantages—all constituting items that would swell out the total. Then, and that is the chief thing, what advantages does the soil of Scotland offer? Why, none at all, but just the reverse. All these would be on the side of the old horse-breeding districts; and when the subject is looked into, it really seems as if the districts which have produced certain animals to the greatest perfection, with least expense and trouble, are those that have been long renowned for the special class of animal, and which afford withal fine grass meadows, consisting of old sward on sound-undulating soil. Here, then, we find the first essential element of success for horse-breeding; besides good grass, we have good hay, the making of which is so much better managed in the south than in the northern division of the kingdom.

On the other hand, the Lothians, and most of the Lowlands of Scotland, are under the highest state of cultivation, as if brought into that state at a later period when farming had taken a systematic form; there no meadow grass is to be found, or the quantity is comparatively small; the land being most valuable for the alternate green and corn crops it produces, whilst the other divisions of the soil, consisting of mountains and moors, offer no favourable resources for the production of race-horses. On the whole, then, it seems to



us that Scotland does not hold out a premium to breeders of the blood-horse, and that the more discreet plan will be to exchange commodities, and purchase such stock in England. Undoubtedly, the beautiful parks amidst which the seats of the rich of the country are situated, would afford accommodation for breeding blood-horses; paying, however, is another question.

A few good stout blood-stallions adapted to produce horses for various purposes, to be such as a few chance thorough-bred mares could be put to, with the prospect of a race-horse being the result, is the kind of horse most in request in Scotland. And we shall still expect to see the winners of the great events come from the green slopes on which their ancestors gambolled. When we are shown the spot where Old Tramp, Blacklock, and Lottery were bred, or that where Zilho da Puta acquired his stamina, and again revisit the chalk-hilly park of Audley End in which the antagonist of the latter, Sir Joshua, was reared, we can readily connect cause and effect. The right sort of stock in the right place, to be rightly managed, is the advice we should tender to horse-breeders, and especially if racing be held in prospect, in which case, for the assigned purpose, the stock will either be worth much or nothing, according to its form.

---

## ROYAL COLLEGE OF VETERINARY SURGEONS.

---

### QUARTERLY MEETING OF COUNCIL.

The Quarterly Meeting of the Council was held January 13, 1864.

PRESENT :—Professors Spooner and Simonds, Messrs Braby, Broad, Dickens, Ellis, Field, Gardiner, Harpley, Hunt, Jex, Lawson, Mavor, Moon, Pritchard, Wilkinson, Withers, and the Secretary.

The President being absent through indisposition, it was moved by Mr Wilkinson, and seconded by Mr Pritchard—"That Mr Harpley, Vice-President, take the Chair."

The Minutes of the preceding Meeting were then read and confirmed.

A letter received from Mr Jex was read, in which he begged to present to the Museum some Model Legs of the Horse now laid upon the table.

It was moved by Mr Wilkinson, and seconded by Mr Ellis—"That a vote of thanks be given to Mr Jex for this acceptable present."—Carried.

The Finance Committee reported that they had examined the vouchers and receipts of payment during the preceding quarter, which were found to be correct. The Quarterly Balance Sheet of

the Treasurer's Account showed that the present liabilities amounted to L.74, 1s. 1d., which the Finance Committee recommended should be discharged. The balance left in hand, after the payment of the liabilities, would be L.479, 14s.

It was moved by Professor Simonds, and seconded by Mr Jex—"That the Report be received and adopted."

The election of two Members for the Court of Examiners, in the place of Messrs Quain and Field resigned, was next proceeded with.

It was moved by Mr Prichard, and seconded by Professor Spooner—"That Mr Ellis, of University College Hospital, be elected to fill the vacancy occasioned by the resignation of Mr Quain."

On the ballot being taken, Mr Ellis was found to be duly elected.

It was next moved by Professor Simonds, and seconded by Mr Wilkinson—"That Professor Morton be elected one of the Board of Examiners to fill the vacancy caused by the retirement of Mr Field."

It was also moved by Mr Harpley and seconded by Mr Braby—"That Mr Jex of the First Life Guards be elected to the vacant seat."

On the ballot being taken, there were found to be for Professor Morton, 10; for Mr Jex, 5; whereupon Professor Morton was declared to be duly elected.

Cheques were ordered to be drawn for the current expenses.

The business of the Quarterly Meeting having terminated,

A SPECIAL MEETING was held, the same members being present, to consider Mr Wilkinson's motion for the alteration of Bye-law 21.

After a lengthy discussion on the proposed new Bye-law not being sufficiently comprehensive to meet the requirements of the case, Mr Wilkinson withdrew his motion.

It was moved by Professor Simonds, and seconded by Mr Wilkinson—"That a Committee be appointed." The following gentlemen were nominated on the Committee:—The President, Professors Spooner and Simonds, Messrs Mavor, Wilkinson, and Withers, to draw out an amendment to consider the alteration of Bye-law 21, in connection with other laws relative to the Secretary in the Court of Examiners acting for Scotland, and the arrangement which the Council entered into in the appointment of its present Secretary.—Carried.

By Order of the Council,

WM. HENY. COATES, *Secretary*.

---

## MEETING OF SOCIETY.

---

### NORTH OF ENGLAND VETERINARY MEDICAL ASSOCIATION.

THE first meeting of the above Society was held on Friday, January 15, 1864, at the Crown and Thistle Hotel, Newcastle-upon-Tyne, and was very well attended. In addition to the previously formed list of members, Mr Jno. Fairbairn, Alnwick, Mr W. S. Moore, Gateshead, and Mr Thos. Coates, Brampton, Cumberland, were admitted.



The manner in which the proposal to form such a desirable Society in the north of England has been received, is very gratifying to the promoters, particularly in this instance, as it is evident that elements not only exist, but are available for the establishment of an extensive and influential association, the tendency of which must be that of mutual good.

The usual business preliminaries having been arranged, the President (Mr C. HUNTING) proceeded to deliver the following address :—

Gentlemen,—In taking a retrospective glance at our profession, there are many things upon which we are justly entitled to congratulate ourselves, but there are still some points which are blots and stains upon our escutcheon. Our object, therefore, as professional men, should be to multiply as much as possible the former, and radically root up the latter.

I am not one of those who take a desponding view of the Veterinary profession. That we do not stand so high in the estimation of the public as we have a right to expect, I am quite willing to acknowledge, but the fault is principally owing to the members *as individuals*, and not as members of the profession; for, although the profession does not prevent a gentleman from being received as one, yet, unlike the clerical, legal, and medical, it does not give us a status in society unless we individually, by our private and professional conduct, deserve it. It is therefore the bounden duty of all members belonging to the profession, who have the well-being of Veterinary science at heart, to do all in their power as individuals to raise the profession to the position she has a right to occupy. This can only be done by demonstrating to the public that we are really what we claim to be—thoroughly scientific men, willing and able to keep pace with all the collateral branches of science with which our own profession is so intimately connected, and which alone will enable us to prove to the public the worth of an educated Veterinary Surgeon over the charlatan or farrier, who only excels the former by the larger number of animals he kills. It is only the idle drones in the profession who flatter themselves that, because they have managed to get the parchment of the Royal College of Veterinary Surgeons, that its possession alone will induce the public to entrust the treatment of their valuable horses and cattle in their hands in preference to a non-graduated man. Wofully do they find out their error when in practice, and cry aloud, Empiricism! Empiricism is our ruin! Yes, empiricism is their ruin, and will always be so, unless they prove their superiority by practical results, which can only be done by those who love their profession, possess great energy of mind, coupled with constant perseverance and an invincible determination to succeed. With these essential requisites to success in every profession—in none more than our own—the empiric cannot continue in the race with the well-trained understanding of the educated Veterinarian any more than the unlettered serf of Russia can compete with the free and well-trained mind of the English mechanic in producing those wonderful pieces of mechanism which we see daily brought before us in commercial and agricultural pursuits.

There are *three* important matters connected with our profession which I shall briefly bring before your notice. The *first* is the great need of a higher standard of education in the majority of its members. No one knows so well the immense disadvantage—I had almost said the irreparable disadvantage—which the uneducated or indifferently educated Veterinarian labours under in almost every step he takes, as the man who unfortunately experiences the want of it; however laborious, however energetic, however persevering he may be, he thoroughly understands how impossible it is for him to instantly bring before his view all the bearings of his case, reason accurately and logically upon them, and at once deduce sound data upon which to act, in the same way, or to the same degree as the well-cultivated brain. If this is so, why do we not have an educational test before entering our veterinary schools? It is not only necessary, if we wish to raise the status of the profession, but absolutely essential for the protection and requirements of the public. I know it has been said by some that such a proceeding would close



the door of the profession to many valuable men. I do not believe that it would have such an effect : the sons of members of the profession, the young thinking farmer, and even the intelligent groom, who were anxious to enter our ranks, instead of being daunted by such an examination, would apply themselves in good earnest to obtain the necessary information to enable them to pass the ordeal which would lead them through the door of a noble and rising profession. Doubtless, a few who are now members of our profession would not have been, had such a test been placed before them, which circumstance would have added greatly to the respectability of the profession, to their own ease and comfort, and much to the advantage of a confiding public. *Secondly*, A much longer and more extensive curriculum of college tuition, not less than three full sessions, with the addition of botany to the other classes ; and *Thirdly*, The necessity of a greater unanimity in the members of the corporate body, who, if in earnest, would be able in a great measure to induce the professors at our veterinary schools to acquiesce in such measures as have been suggested ; and I know of no step which is so likely to bring about the desirable consummation of the latter, as the establishment of Veterinary Medical Associations in all our large provincial towns, as we have this day done in Newcastle-upon-Tyne, as will be next week in Leeds, and has long been in Glasgow.

Amongst the foremost objects of provincial veterinary medical associations is unquestionably the investigation of epizootic and enzootic diseases, and the discussion of the best modes of treatment necessary for their removal, and specially the means necessary to be taken for the prevention of their spreading and re-appearance, and where that is impossible, to adopt such measures as shall reduce its fatality or deteriorating consequences to the minimum point ; and surely the most efficient way of obtaining such a desirable result is to be found in freely discussing the general as well as the particular characters of the malady in question by a number of professional heads devoted to the study of such diseases, and who have the opportunity of doing so in many widely separated districts where it may assume modified forms and characters ; for although no true and earnest worker, be his field of observation ever so limited, can fail in making a certain description of progress, still, if he has not the power or the opportunity of comparing the results of his labours with those obtained by others, and of thus simultaneously extending the scope of his observations, he must toil at a great disadvantage, and incur the risk of constantly being in error, or at best he only compensates by a loss in general range for what he gains in some special department. Again, another important—I had almost said an unlimited—field for our investigation and discussions is the hygiene of our domestic animals, one which would well repay all who have the opportunity, and are willing to labour for the benefit of others, and for the advancement of an important branch of science, and one absolutely inseparable from the veterinary profession. For my own part, I must confess that I consider the study of hygiene is of far more importance than the study of therapeutics. Surely there is much more true philosophy and more noble scientific research in the prevention of disease than in the cure of it. I do not hesitate to assert that three-fourths of the diseases of the lower animals are produced by not sufficiently attending to the laws of hygiene. At the present day, when agriculture is making such mighty strides, when the largest portion of our farmers are beginning to read, and think, and reason for themselves upon every-day facts brought before their notice, when shrewd and clever business men, bent on money-making, are concocting concentrated foods, condimental foods, nutritious oil-cakes, made with one half-bran, bought at L.5 and sold to our customers at L.10 ; when we have our Hassells, Normandys, Warringtons, and our Thompsons, detecting the adulterations and impositions of the vendors of food to the bipeds, shall we allow men out of the veterinary profession to detect the adulterations and impositions of the vendors of food for the quadrupeds. No, I hope not ; that should be the province of the veterinary profession ; if that profession delegate the most important scientific part of its duty to men out of its pale, what right have we to complain if the public judge



us according to our fruits? Again, when the professional veterinarian meets with the well-educated farmer or proprietor of large numbers of animals, who has studied Comb and Carpenter, Liebig, Johnstone, and Voelker, and filled his well-trained mind with useful information, what opinion would he—must he—form of a large number of us who scarcely take sufficient interest in these matters to read even our own monthly periodicals, much less study the subjects upon which the authors mentioned have written? I apprehend that such men as I have just sketched—and there are many of them amongst our best customers—would not be long in forming their opinion as to how far we are entitled to rank with the educated and scientific men of other professions.

There is nothing more obnoxious to a well-educated, common-sensed Englishman than a counterfeit, and there is no greater counterfeit than the veterinarian who imagines that because he has spent two sessions at one of our Colleges, and taken his diploma, needs no more study—that he has learned all that is necessary; whereas, when we leave our *alma mater* the best amongst us have only laid a solid foundation on which to raise a useful superstructure, whose adornments should be microscopical investigation, agricultural chemistry, chemical analysis, botany, geology, meteorology, &c., &c., without a general knowledge of which we must be content to be placed out of the pale of scientific men. Another important subject for associations, such as we have this day commenced, should be to investigate the laws of breeding in all our domesticated animals, especially of the horse and ox. No one has the ear of the breeders of our patients so much as the veterinary surgeon, and as a rule, his advice is asked and acted upon when he holds the position he ought amongst his employers; and as no one has the same opportunity of observation as the veterinarian on this subject, he ought ever to be noting down useful facts, reasoning upon them, and deducing therefrom lessons of great importance to the agriculturist, and through him to the whole nation. I know that in the south-east portion of Durham, a few years ago, nineteen-twentieths of the breeders of horses were carrying out the most absurd system imaginable. The following questions have been frequently put to me, “Do you know any one who has an old mare done work, that I could buy cheap to breed a foal from? or another who has a wretched, ill-shapen, worn-out mare, 18 or 20 years of age, with spavins, side-bones, thin walls, and flat feet, long coupled and narrow-chested, will ask what horse he had better put the old mare to, for she is worth nothing more than to breed a foal from? If you tell these men the most economical way is to shoot the old mare, and if he wishes to breed, to do so from his prime, strong, well-made young mare, he will at first shrug his shoulders and tell you he cannot afford it, the young mare must work and the old one cannot; but when you reason with the man, and show him that the old mare will cost him as much, or more, to keep than the young one, that the foal of the latter will in all probability be worth treble that of the former, that while the defects of the old mare will certainly descend to her foal, causing great difficulty of sale even at a low price; the offspring of the young mare, free from such defects, will not only sell at a good price, but dealers and others will soon find out where the breeders of such good horses are, and will be always ready to take such for sale much above the market value, he will thank you for your advice, and adopt it. I shall not occupy your time further on the subject of breeding, but I feel certain that the profession would do well for its own interests, if they took a greater interest in the breeding and rearing of agricultural live-stock than they do. It is by giving good sound advice gratuitously to our customers, arrived at only by years of observation and research, that will make the public appreciate the educated and scientific, more than the man of mere routine. Having touched upon a few of the subjects which, in my humble opinion, should occupy part of our time at our Quarterly Meetings, I shall, in conclusion, notice a few of the rocks and quicksands our professional bark must be exceedingly careful to steer clear of, or she will inevitably go to pieces, and the compound body will assume the elementary form.

The first in importance is, that there should never be allowed any personal matters whatever to enter into our discussions. There is, as we all know, a cer-



tain amount of clashing of interests, between professional men of the same calling, everywhere; and the veterinary profession is no exception to this rule, and therefore it should be thoroughly understood that the least allusion to anything of a personal character would be considered as an insult to all its members. If this association is to go on, and become of any use to us as professional men, we must rally round this point as a point of honour, with all the tenacity of brave soldiers to the colours of their regiment. I press this advice the more earnestly, because I know this has been the rock upon which similar associations in the medical profession have foundered—of which I was an honorary member. Another shoal which we should steer clear of, is the rate of remuneration we receive for our services; this, in my opinion, should be left an open question—for every man has a perfect right to put his own value on his own services. If one man thinks his services are not worth more than half that of his neighbours, by all means let him take the half,—the probability is, if he did not, he would be doing an act of dishonesty to his employers. Low-priced professional services are, as a rule, like nearly all other low-priced articles, thrown aside by all sensible men as being by far the most expensive when tested and brought into use. I will not occupy your time by further remarks of my own, as I know there are some very interesting cases and morbid specimens for discussion which will doubtless interest you far more than any matters I am able to lay before you in this address.

I must, however, before I conclude, award honour to whom honour is due. It may not be known to all the members of this Association that the sole merits of bringing together so many of us to day, and the establishment of the North of England Veterinary Medical Association, is entirely due to our worthy Secretary. I confess that when the matter was first mentioned to me I did not hesitate to pronounce it a failure; not because I could not see the value of it, if properly carried out, but what I feared was, the want of unanimity amongst the members of the profession in this district; however, Mr Armitage was nothing daunted by my faithlessness in his undertaking, and no one would be more delighted than myself to see his most sanguine expectations realized.

The address was warmly received by the members, and a vote of thanks to the President followed, which was cordially agreed to, in reply to which further valuable remarks were elicited.

Mr H. E. Wilkinson afterwards kindly introduced a very interesting specimen of extreme and rare form of tuberculosis in the lungs and liver of a cow.

The former, when taken from the animal, were found to be the enormous weight of 70 lbs. The structure was compact—the interlobular space being replaced by condensed tissue, in which were few abscesses, but finely studded with calcareous granules. What gives the case greater singularity is the fact that HALF ONLY of the right lung was pervious. No symptom of affection of those organs occurred, neither dyspnoea nor accelerated action,—the prevailing indications being those of a rheumatic character—terminating in paralysis.

The next meeting is fixed for the 15th of April, when Mr Thompson will introduce a paper on “Tetanus.”

---

## PERISCOPE.

---

### THE TURF AND THE SCOTCH.

By “ICONOCLAST.”

(From Bell's Life, December 26, 1863.)

“SCOTLAND, poòr and proud,” is a proverbial expression. There would certainly appear to be some *prima facie* evidence of the truth of the former, although with regard to the latter they may be absolved from the soft impeachment when



applied to their racing carnivals. The noble pastime, with only six legitimate "fixtures," viz., Kelso, Edinburgh, Western Meeting (Ayr), Perth, Lanark, and Airdrie, "drags its slow length along" in a manner scarcely in accordance with the progressive movements of the age; nevertheless there are resources in the country amply sufficient to maintain it in efficiency and popularity, if properly cultivated by the officials who stand sponsors for the *six legitimates*. The Turf here may be compared to a puny child, rocked in the cradle of incompetence by slipshod nurses and careless parents. Neglected and despised, it is slow in the development of form and maturity, and in its present feeble, pulseless state, will require a liberal prescription of L. s. d.—the *elixir vitæ* of the Turf—to give it vitality, and a nourishing regimen to enable it to attain the gaiety and genial impulsive vigour of robust health. Racing here is at present down at heels and out at elbows; its general contour assumes an impoverished appearance by no means flattering or creditable to the country, and it will require all the well-directed energy, influence, and available cash at command to promote its welfare, and produce a semblance of that high respectability to which it is entitled by birth. The first "is a certain find" for the latter, and the whole combined would eventually produce pleasing results by making the sports of national interest and importance. At present, while some of the racing officials are making rapid strides in the right direction, others appear to be afflicted with a ghastly sort of coma which paralyses their whole being, and their want of systematic management and application is as infelicitous in results as the worst enemies of the Turf could desire, and as destitute of progression as it is diametrical to the plodding perseverance of the people in other matters.

The breeding of blood-stock in Scotland is also at as low an ebb in the tide of progress as racing, although both show their satisfactory balance-sheets in other parts of the United Kingdom, under judicious management, realizing profitable returns to individuals, and supremacy of the nation over other countries in the production and improvement of a marketable commodity in a high state of excellence. Their performances on the Turf are the public tests of merit, and while distributing prizes to the successful, it sows pleasure broadcast to the onlooker, and drops its annual "nest egg" (without a "cackle") in the coffers of Her Majesty's exchequer (it may be) as a sort of philanthropic conscience-money for its trivial sins.

The immense prices paid for young stock (mere baby-horses), well-tried, sound performers, and even broken-down "clippers," possessing the fashionable and useful ingredients—blood, substance, gameness, staying powers, and well-developed frames—are undeniable evidences that the breeding paddock is a fruitful vineyard, which only requires judicious cultivation from good husbandmen to realise profitable results; bred for substance rather than speed, and if the produce is not a high-class race-horse the elements of a hunter will be created, and there are always plenty of "good men and true" in the market to pay a good price for either. It may be argued that the climate of the country is not sufficiently genial to promote growth and early maturity in breeding stock for Turf purposes, but, although some parts may be, and are inappropriate, a reference to the files of *Bell* or *Weatherby* will show that many of Scotch breed have proudly held their own, and paid their way in contests with the best company in the south, thereby proving that a successful issue to breeding speculation is within the grasp of those possessed with intelligence, perseverance, and money, to attempt it. It is somewhat remarkable that the exhibitions of equine excellence on the Turf are not better patronised, as exhibitions generally have become as fashionable sources of pastime as they are prolific in profit to the successful; and it may be assumed that, irrespective of the pleasures they may bring to the Corinthian time-killer, or those who require occasional relaxation from the humdrum of business and toil, or the advantages to matter-of-fact individuals of practical proclivities, they may be fairly considered national features of a country's progress and tests of special merit. Manufactures of every description—horticulture, floriculture, the feathered tribe, and beasts of all denominations—are exhibited, admired,



commented on, and gain prizes for special excellence ; it is, however, requisite that the Scotch, while acknowledging the general usefulness of such competitions, should not ignore the claims of "that noble animal, the horse." Monster turnips, fat sheep, plethoric gooseberries, "neat" cattle, inanimately waddling in their own fatness ; dogs, tiny, massive, ugly, beautiful, useful, or useless, of all degrees and temperaments ; or pigs, whose obese disproportions are suggestive of apoplectic termination, may be nice pet subjects for admiration and patronage, but it is here well worth noting that the exhibitory contests in the arena of the Turf are displays *par excellence*. They gratify a sporting taste for pleasure, and test the blood, cultivation, speed, and endurance of the most useful servants of man, and the prizes thereby gained act as a stimulus to the further production and improvement of quality and quantity, which thereby enhances the value of the equine creation.

It is argued, with needless asperity, that racing is a conglomeration of good and evil, with the latter predominant ; but as the two are inseparable in any cause, however just, that goes for nothing as a detraction, but should rather act as an additional reason why this great representative of pleasure, with its undeniable utility, should be grasped by the warm hands of friendship, and be more generally introduced to, and received by, that portion of the population representing "society," and by the aids of such friendly countenance, influence, support, precept and example, be raised, "like Cæsar's wife, above suspicion." The sporting journals are true conservators of the interests of the Turf ; they hand down to posterity the fame and names of those who are advocates of its just principles, and exercise a stern censorship over those who, with discreditable greed for gain, adopt the quaker's advice to his son, "Get money, honestly if thou can, *but get it.*" It is, however, unfair to draw the conclusion that Turf transactions are one whit less pure than those of trading generally, or of the fawning sycophant (in particular) over a counter, who, living in cozy affluence at his villa, advertises his bargains, bankrupt stocks, and striking sacrifices, and realizes an extra percentage out of public credulity by so doing. English prejudices against the sport have melted into such thin air, that it is now patronised by the highest personages in the realm ; and when it is considered how the edifice of the Turf has been built up bit by bit, until it now assumes the massive proportions of an "institution" worthy of England, and of imitation by France and other countries, it is surprising how Scotland should remain blind to its usefulness, its pleasures, and profits. It is a very general impression that its seductive pleasures are sure forerunners of evil ; but it is ridiculous to assert that those pure in thought cannot mix in its pleasures and speculative profits without being impregnated with foulness, or polluted with the atmosphere of blackguardism. It is an undeserved taunt on Turf pursuits, and a libel on the integrity, the self-control, and discrimination of the people to say so.

Racing also exhibits a diploma in the science of equitation, for which the public generally might with advantage study for a "degree." The very weak argument that it is a cruel exhibition, is only pre-eminent for the falseness or ignorance of those who make such assertions. Experience has taught the professional jockey when to ease the animal under him, and when to "send him along ;" and any horse possessed of mature condition, vitality, action, and gameness due to inherent breeding and spontaneous energy, is as assuredly free from unmerited castigation as any Lady Godiva's pet who does his customary five miles per hour at a rocking amble. The jock who replaces artistic riding with unneedful punishment sacrifices his name as a horseman, and when one is found giving vent to his passions, and daring public opinion by his violence, he is loudly condemned as a butcher, and brought before the Stewards of the meeting for wanton cruelty. Injudicious acts of punishment to the brute creation are based on ungovernable passions or ignorance, and are as reprehensible in the eyes of the *blasé* turfite as the meek individual who turns up his eyes and his hands with a mock solemnity of horror. Brutality is an unenviable feature, which bears no affinity to the professional capacity and general system of the jockey. The horse-



men of the Turf, as a class, give less vent to violence than any others. Schooled as they are in early youth to the requirements of their position, those of too excitable or passionate temperaments are put aside as useless for the required purpose, or become toned down to calmness, self-possession, judgment of pace, and artistic system of "nursing" the powers of the animal they bestride, which rarely fails them in the most critical exercise of their vocation. There is, however, an old and generally accepted axiom which may be here introduced, "Spare the rod, and spoil the child." Well, then, the systematic aids of horsemen, used either separately or conjointly with the whip and spur, are to the horse what the stern admonition and birch rod are to the child. There are uses and abuses in everything; capacity and ignorance may be taken to represent them. The birch should only be applied to the child when warnings are ineffectual. So it is with the jockey when he sits down to ride his horse. An accelerated half-circle springy movement of the hands acting on the reins, is a very suggestive admonition for an increase of speed, which every horse well understands, and if he fails to acknowledge it, the persuasive use of force is of necessity naturally resorted to. A whip wielded with the vigorous artistic twitch of a horseman is no doubt a severe bit of "rib-binding" flagellation, but it is the requisite agent for awakening the sluggish temperament of the lazy or cunning, and the sharp spasmodic click of the spur at his flanks may be the only effectual method of dispelling the bad propensities of the arrant rogue or the viciously inclined. Again, it is a well-understood fact that there are many game, good horses on the Turf who actually wait for the initiative from the "flail or the Latchfords" before they will go even fast enough to tire themselves. This is, of course, a peculiar character to give "the high-mettled racer," and sounds queerly in the ears of the uninitiated, but the records of the past prove it true, and the public should therefore be perfectly satisfied of their own knowledge of equitation before they condemn that of the jockey. This subject has been thus much dilated upon, because the character, respectability, and humanity of the trainers and riders have been as much misrepresented in Scotland as they are misunderstood. The immense value of blood stock, in many instances, entrusted to the charge of a trainer, requires the unbounded exercise of undeniable abilities, and the interests at issue render it requisite that his character should be as spotless as a prime minister's. It is a trainer's duty, his study, care, and solicitude, to train raw material into refined excellence, and develop the elements of a horse's greatness and powers; the disposition, constitution, and temperament of each animal have to be minutely treated with the assiduous attention of a mother's welfare for her children, and a life of anxious doubts, fears, and triumphs are the results. A spare provision of nature's bounties in bulk of person, that general experience which a martinet sort of *régime* has inculcated in his system, an adamant determination to resist tempting monetary influences to do wrong, abstemious habits, and strict observance to instructions, are a few of the requisites to ensure successful results to the professional career of a jockey; and when it is considered that the clearness of intellect and development of capacity to handle a horse according to theameleon vicissitudes of a race are so great, when, in fact, the experience and apprenticeship of a lifetime are brought to bear on a focus of time, ranging say, from one to three minutes and a half in duration, it is one of the wonders of the age. The artistic "finish" of a Fordham, a Challoner, or an Aldcroft, are as fine bits of artistic excellence as the last finishing touches to a picture from the hands of a Landseer or a Herring.

There is another branch of the Turf which is alike attractive and useful, viz., that which applies to hurdle races and hunters' stakes, for horses that possess the attributes and *bona fides* of legitimate hunters. The Edinburgh and Lothians Racing Club have inaugurated a meeting for this purpose, and such *réunions* might be successfully introduced at other places, as the general public and hunting men have a *penchant* for it, and by fixing such meetings in spring it produces a happy *coup de grace* to the close of each hunting season, and brings together the Nimrods of the Chase in social commune to discuss with chaffy relish those "nice things," the brilliant runs of the past. There is, however, one impedi-



ment to absolute success ( which is, however, easy of removal ), viz., the admission of non-hunters into hunters' stakes. I should not run true to the *nom de plume* I adopt if I did not make it a duty to demolish this false idol, and expatiate on the folly of admitting bloody-looking, weedy screws, and nonentities of "leather-flapping" notoriety—who can't or won't jump an inch—to contend for *hunters' stakes*, without their being possessed of one legitimate qualification which solely applies to the substance, blood, and culture of sterling cross-country performers. It is a well-understood fact that thorough-bred weedy squibs, whose marketable value is barely equal to a butcher's hack, can and do be at accomplished hunters of tenfold value in a spin on the flat, although they cannot show creditably with the latter in even a short run with hounds over an ordinary closed country. Well now, as the prizes given for hunters' stakes and hurdle races have their origin in the desire to promote improvement in the quality of hunting stock, the equine requisites to enable a horse to live at the tail of any hounds, with a fair pilot on his back, are stoutness, strength, a nice turn of speed, and that *sine qua non*—cleverness to negotiate any reasonable cross-country difficulty. It is therefore an abuse of the principles on which such races were inaugurated to let in the genteel-looking abortions—which possess the speed, but none of the accomplishments or endurance of hunters—to the certain exclusion of the stout and good, for gentlemen here will not enter their hunters except to contend with those of a similar class; and they are quite justified in so doing, for what possible chance can they have against a speedy wretch who gallops through instead of over the lightly-fixed hurdles, or floors the obstacles in his stride with the facility of a prize-fighter knocking down an opponent. The social evil to a great extent lies here: the certificates of qualification come from the masters of hounds. The onerous nature of their duties, and the wide extent of ground over which the "field" is scattered, does not always enable them to observe whether such and such animals are duly qualifying in the runs or not; the consequence is, that evils creep in, and any "knowing cove" possessed of a L.10 "crock," a pair of breeches, boots, and unlimited assurance, can procure a written qualification for his useless brute, without even a jump, by attending a few "meets," and at the "gone away" boldly rushing his cranky impetuous velocipede at a few thin fences (who performs in a manner of an acrobat going through a paper hoop), he quietly disappears homewards ho, with the pleasurable satisfaction that his mission for the day is fulfilled, and that he has "done 'em nicely." There is also another unfortunate feature in the form of qualification, and whereby the master of hounds is imposed upon. For instance, that offshoot of Dundrearyism, Adolphus Spooney, Esq., of Blarney Hall, who has neither the ability to school a horse to the duties of the field, nor possessed of brains, seat, nerve, or "hands" to assist in getting over the ordinary ground and fences, not to say obstacles, which nature and the necessities of agricultural requirements place before him, can and does secure the coveted voucher by occasionally appearing at the covert side on a race-horse whose fencing powers are *nil*, and by exchanging the courtesies of the field with the M.F.H., afterwards taxes the memory, affability, and good nature of the powers that be into compliance with a request that in reality should never be granted; the horse has certainly been *seen with hounds*, but, permit the suggestion in the interests of hunt club races generally, that if the masters have not seen, or been satisfactorily informed, that such and such horses have been *regularly* and *fairly* hunted, they should exercise the prerogatives of their position and courteously refuse the signature. But irrespective of this, the clerks of courses have to a great extent a remedy in their own hands, so far as regards the jumping. With a false feeling of humanity hurdles are generally fixed so loosely that the slightest touch, and sometimes the wind, have been found sufficient to knock them down, and in such cases the speedy non-jumpers claim unfair advantages over their more clever opponents. The most effectual bar to this is to have the hurdles firmly built and securely fastened down to resist the impetuous rush of the impostor, so that, in fact, they must jump or take the consequences of rushing against them. Eight 3 feet 9 inch hurdles spread over a distance of two miles, and built in the manner



indicated, are trifling tasks for the educated hunter, but effectual agents in winnowing the wheat from the chaff.

If these ideas are generally acted upon there is no doubt that it would ultimately produce larger "fields" of true hunting blood, and receive better support from hunting men generally when they found their interests duly conserved. The attention and opinions of members of this great metropolitan pastime are courteously invited on this subject. A reform such as is now proposed would eventually have the indirect effect of creating a better class of well-bred weight-carriers to supplant the "weeds" and the slow, "coachy"-looking representatives which are perforce now so much in use; and it would create an additional feeling of interest if such masters and members of the hunts as the Earl of Wemyss, Earl of Eglinton, Sir David Baird, the Hon. Jas. Sandilands, Messrs Ramsay, Maxwell, Mitchell Innes, Deans, Calder, and other well-known performers in the pigskin, were to indulge in amicable rivalry for pride of place. Let us hope that the time is not yet far distant when their names will be thus recorded in the columns of *Bell*.

## RECENT DISCOVERIES IN ENTOZOOLOGY.

(From the *Intellectual Observer*, January 1864.)

It cannot have escaped the attention of any well-informed reader that the subject of Entozoa, or internal parasites, is daily assuming greater importance; and this, of course, not so much on account of the very curious natural history phenomena which these singular animals exhibit, as on account of the strange part they play in the production of suffering and disease, alike as regards ourselves and the animal creation in general. In the pages of "*The Intellectual Observer*," one of our contributors (Dr Cobbold) has supplied us with many interesting facts respecting certain parasitic forms which infest birds, beasts, and fishes; but he has not at present said much about the entozoa, whose special prerogative it is to take up their abode in the human body. We have, however, lying before us an important work bearing on this subject, as well as a small brochure, by an author whose name is probably known to some of our readers.<sup>1</sup> In the larger work, which is as yet incomplete, the author enters very minutely into the structure, mode of reproduction, and general economy of the human parasites, dwelling more particularly on those species which produce fatal results.

Instructive as it might be, it is scarcely necessary to take into consideration the various steps by which the earlier entozoological observers arrived at the conviction that the little watery cysts, or *hydatids*, found in man were in reality animals; but we cannot allow the present opportunity to pass without rendering a tribute of homage to those recent investigators and discoverers in this department of science, who have frequently, at considerable risk to their own personal comfort, demonstrated the true source and nature of these lowly organised beings. To Dr Kuchenmeister, above all others, this recognition is due, and it redounds greatly to the credit of Leuckart (who, at the present hour, is legitimately placed at the head of continental helminthologists), that he has, in the writings quoted below, done full justice to the physcician (formerly) of Zittau. Thus, in speaking of the small cysticerci, or measles of pigs, whence we obtain one kind of tapeworm, he says:—

"Kuchenmeister hit upon the idea of administering the measles as provender to other animals, and of studying the changes which took place in the alimentary canal of the quadrupeds thus fed. Such a trial might very naturally suggest itself to any one, but this does not lessen the merit which belongs to Kuchenmeister, seeing that the result was thoroughly decisive. During the passage of the

<sup>1</sup> "Die menschlichen Parasiten und die von ihnen herrührenden Krankheiten." Von Rudolf Leuckart. Erster Band. Leipzig, 1863. "Die neusten Entdeckungen über menschliche Eingeweidewürmer und deren Bedeutung für die Gesundheitspflege." Convers. Jahrb. 1863.



'measles' through the stomach, they lost their caudal vesicle, which part had previously so strikingly distinguished them, the thin walls succumbing to the influence of the digestive fluids ; only when the quadrupeds were proper hosts did the cephalic ends of the cysticerci resist the action of digestion. In this case they passed on, together with the contents of the stomach, into the intestines, in order to anchor themselves here by means of their sucking appendages, and also to stretch and grow into the adult tapeworm condition. (Jahrb. s. 629.)"

Besides these experiments on animals, it is well known that Kuchenmeister was permitted to feed two condemned criminals, to one of whom he administered seventy-five measles of pigs three days before his execution, the other having eaten twenty measles on two separate occasions at considerable intervals. In the first case ten very young tapeworms, only a few lines in length, were found after death, and in the second experiment nineteen were found, eleven of which had advanced to the condition of maturity. Subsequently, several young men, we are told, voluntarily came forward in the interests of science, and swallowed fresh measles, and three or four months afterwards showed unmistakeable signs of suffering from tapeworm. They were, we presume, deprived of their internal guests by the employment of the ordinary remedies, when, at least, they had satisfied themselves that they had played the part of host long enough.

But it is neither the measles of pork producing the *Tænia solium* of man, nor the measles-like cysticerci of calves and oxen, producing the *Tænia mediocanellata* (equally common amongst our veal and beef-loving community) ; nor, again, the *Oxyuris*, vexing children ; nor the *Trichinæ* of sausages and hams, and the closely allied species of *Ascarides* (which we probably obtain by drinking unfiltered water) ; it is not, we say, any of these forms about which we need particularly trouble ourselves just now, but it is in reference to that most fatal of all disease-producing parasite, the so-called *Echinococcus*, to which we now most especially desire to call attention.

Veterinarians, sheep-breeders, stockmasters, and others practically acquainted with the diseases of our domesticated animals, are at length exerting themselves to ascertain the best methods by which their flocks and herds may be rendered secure from the invasion of certain of the above-mentioned entozoa ; but few, if any, of their number are probably aware how much more disastrous to human life are the larvæ of a small tapeworm which lives in the intestines of the dog. In those countries where this animal is well nigh indispensable to human life, it is at one and the same time both a curse and a blessing. The tapeworm (*Tænia echinococcus*) of the dog produces a larva which annually destroys its hundreds and its thousands of the Human race ; and sad is it to reflect that the disease thus produced is too often, through sheer ignorance, multiplied and propagated by those who pretend to be able to cure the disease. In happy England fatal cases are of constant occurrence, but it is in Iceland that this disease assumes a formidable endemic character. According to Leuckart and Dr Krabbe (a pupil of the recently deceased savan, Eschricht, of Copenhagen), who has specially visited the country to investigate the disease, the following facts may be relied on :—

"For every 100 inhabitants of Iceland there are 1100 head of horned cattle, and every peasant has on an average six dogs. In Denmark there are 180 catt'e to every 100 of the people. There are many of the Iceland doctors who, not unfrequently, have upwards of 100 patients, afflicted with the Echinococcus disease under treatment at the same time, the total number of such cases in the island being estimated at 10,000. By far the greater number of these patients, however, are in the hands of quacks, whose influence is the greater, because there are in all Iceland but *six legally authorised medical men*, each of whom presides over a district of about 1500 square (English) miles, embracing a population of about 10,000 individuals. The treatment of the quacks is exactly suited to keep up the epidemic, for, *amongst their remedies, dog's urine and fresh dog-excrement* play a conspicuous part. (Jahrb. s. 654.)"

These statistics are truly appalling ! We have here a forcible illustration of the falsity of the proverb, which says, "Where ignorance is bliss, it were folly to be



wise." Would it be folly to get up a Social Science Congress at Reikjavik, and, in the name of humanity and intelligence, appeal to the Icelandic parliament to put down these evil practices with the strong arm ; at the same time taking every opportunity to enlighten this grossly ignorant population ? Superficial, good-natured, *unintellectual observers* may look on complacently, and even, perhaps, remark that the Echinococcus epidemic is one of those mysterious dispensations of Providence which we ought to accept submissively, without looking too minutely into the secondary causes concerned in its production. For our part, however, we prefer to read His guidings differently, to sound the aforesaid causes to their lowest depths, to search out the animal parasite which thus afflicts mankind, to subject the little beast to microscopic examination, to watch its growth and development, to work out its anatomy, to study its haunts and habits, to make it the source of a series of experiments ; in short, to leave no stone unturned by which we may arrive at a sound conclusion as to the best methods of checking its abundance, and of preventing its destructive assaults upon the welfare of our fellow-men. An enlightened public will eventually applaud these efforts ; but, as in a crowd, it is only the tallest men who see furthest, so, unfortunately, does it happen that our laborious, self-denying, experimental physiologists gain only the respect of the few ; whilst the many, unenlightened, prefer the " old paths," not unfrequently, indeed, placing every obstacle they can in the way of those who silently devote their time and talents to studies which are calculated to benefit us all. If it were necessary to exemplify the truth of these remarks, we should refer to the recent attacks made upon experimental physiologists in reference to the question of vivisection, and other investigations demanding the destruction of the lower animals.

One-sixth of the annual deaths among the population in Iceland are solely owing to the Echinococcus entozoon, and shall we therefore refuse to permit the helminthologist to continue his experimental inquiries on the score of cruelty to animals ? As a shrewd writer in the pages of the " Examiner " has recently very justly remarked, we have now arrived at a time when " every abomination has its zealous and thorough-going advocate."

The little entozoon producing the disease referred to has this singular peculiarity about it, namely, that in the adult or mature condition it scarcely attains a length of one-sixth of an inch, whilst in the larval, imperfectly developed, or so called hydatid condition, it may grow to the size of a man's hat. In the adult state it is a minute tapeworm, with four joints, and a single head, armed with four suckers, and a double crown of hooks ; whereas, in the larval condition, it presents an aspect not unlike those toy air-balls which children play with. This globular hydatid is furnished with hundreds, nay thousands, of heads, each one of which is capable under favourable circumstances, of becoming a tapeworm. The adult worm, as we have said, lives in the intestines of the dog, whilst the death-producing larva infests man and herbivorous animals of the domesticated kind.

Having said thus much about the entozoon, and the disease it produces, one naturally desires to know what methods are to be adopted in order to quit ourselves of these ugly little customers. In the present state of our science we are not, perhaps, entirely able to bring about the total abolition of this terrible hydatid disease, but, at all events, the suggestions of Drs Leuckart and Cobbold show us the way in which we may check it to a very noteworthy extent. We shall therefore allow these gentlemen to speak for themselves :—

" In order to escape the dangers of infection, the dog must be watched, not only within the house, but whilst he is outside of it. He must not be allowed to visit either the slaughter-houses or knackeries, and care must be taken that neither the offals nor hydatids found in such places are accessible to him. In this matter the sanitary inspector has many important duties to perform. The carelessness with which these offals have hitherto been disposed of, or even purposely given to the dog, must no longer be permitted, if the welfare of the digestive organs of mankind are to be considered. What blessed results may follow from these precautions may be readily gathered from the consideration of the fact, that



at present almost the sixth part of all the inhabitants annually dying in Iceland fall victims to the echinococcus epidemic. It is true, that nowhere else, probably, are the conditions for the development, or rather the transportation of the echinococci, so favourable as in that country. The dog being not only of far greater importance to the Iclander than he is to us, is consequently much more generally kept. Another circumstance, also, must be held to weigh very heavily, namely, that almost everybody in Iceland keeps his own stock of cattle, and lives, during the long winter nights, with the entire living stock, usually huddled together in a very small space. Moreover, that cleanliness which we know to be one of the most important preservatives against infection, is but too often wanting in those parts." (Jahrb. s. 654.)

In reference to the same subject, Dr Cobbold, in his paper partly read at the Cambridge meeting of the British Association in 1862, and afterwards more fully communicated to the Zoological Society,<sup>1</sup> writes as follows :—

"My friend Dr Leared has ingeniously suggested that every dog should be efficiently physicked at a certain given time, and that all the excreta, tapeworms included, should be buried at a considerable depth in the soil. The experiment should be extended over several seasons. The mature *Tæniæ* thus destroyed would, it is conceived, cut off the supply of embryos and *Echinococci*, and the endemic might thus be averted. To this suggestion I would add, that in place of burying the excreta, *they should, in all cases, be burnt*. If this latter suggestion be not carried out, it is more than probable that multitudes of the minute embryos will escape destruction, and ultimately find their way into the human body. I have previously urged this preventive measure (in my paper 'On the *Sclerostoma* causing the Gap-disease of Fowls,' published in the Proceedings of the Linnean Society for 1861), with the view of lessening the prevalence of other entozoa, both of man and animals, and I again invite attention to the importance of observing this rule. *All entozoa which are not preserved for scientific investigation or experiment should be thoroughly destroyed by fire, when practicable, and under no circumstances whatever should they be thrown aside as harmless refuse.*

In the case of the *Tænia echinococcus*, the greatest difficulty likely to be experienced lies in the fact of the extreme smallness of this tapeworm. As an additional security, therefore, I would recommend that boiling hot water be occasionally thrown over the floor of all kennels where dogs are kept, for, in this way, not only the escaped tapeworms, but also the little free embryos themselves, would be effectually destroyed."

## THE MELOPHAGUS, OR SHEEP-TICK.

By L. LANE CLARKE.

(From the Intellectual Observer, January 1864).

WHEN the farmer, careful for the wellbeing of his flock, gives the order for a sheep-washing, or a "ticking"—and thousands perish of the parasites which irritate the sheep—doubtless the farmer is right; we have dominion over "the creeping thing," and reason to judge of its proper rate of increase. Nevertheless, that same sheep-tick presents an interesting and thoughtful object for a naturalist, who, entering into the mysteries of organic life, gathers up every minute variation and modification, holding each as a clue to guide him through the labyrinth of Almighty wisdom, which the mere classification of genera and species fails to grasp.

Comprised within the order Diptera, or two-winged flies, we find several genera which have no wings at all: the apterous and suctorial *Pulex*, and the apterous

<sup>1</sup> "Remarks on all the Human Entozoa." By T. Spencer Cobbold, M.D., F.L.S., Lecturer on Compt. Anat. at the Middlesex Hospital.—*Proceed. Zool. Soc.* for 1862; vol. xxx. part iii. pp. 288—315.



and pupiparous Eproboscidae; though amongst these latter we have the winged Hippobosca, or horse-fly, the Ornithomyia, or bird-fly, and the Stenopteryx, or swallow-fly.

The Melophagus is apterous, and possesses some remarkable links with insects of both higher and lower organisation. It is easy to procure, and makes a good object, also for the microscope, if soaked in potash, washed, dried, and mounted in balsam, when it polarizes brilliantly. For present examination we need but use a low power, and look at it as an opaque object, observing that the coriaceous, bristly body is divided as usual into three distinct parts—head, thorax, abdomen; but that, unlike the rest of the Muscidae, the abdomen has no segments, because the system of reproduction, differing entirely from the oviparous or viviparous flies, requires an elasticity and firmness in that part which could only be obtained in a perfectly continuous substance; yet, when the female has expelled the pupa-form of her progeny, there is found, *more or less*, in the Hippobosca, Ornithomyia, and Stenopteryx, transverse plaits or folds of the abdomen answering perfectly to the segmentation of a dipterous abdomen, but fading quite away in the Melophagus.

We may also notice the comparatively few facets in the eye of this sheep-tick, which needs no more for its sedentary life amidst the dark mazes of the matted wool; a high reticulated eye, like that of its nearest relative, the Hippobosca, who darts about in the sunshine, would be wasted here.

The position and strength of its legs we observe as exactly adapted for pushing through the woolly thicket, with claws like harpoons, toothed and striated, clinging so desperately to the sheep that desperate measures are needed to relieve the animal of its parasite. These are only well seen in the mounted specimen, and so also must we prepare the insect to see the perfection of its suctorial apparatus. This is composed of a pair of hairy valves protecting a very slender siphuncle, rigid and sharp, and may be compared with that of the horse-fly, which is shorter, because exercised upon the nearly naked skin of the horse, whereas the Melophagus requires a long, flexible dart, in searching for a vulnerable point amidst the clotted wool.

The next point of interest will be the number, position, and variation of its spiracles.

It has nine pair of these breathing organs—two pair in the thorax, seven in the abdomen—round in form, and edged with simple cilia, quite unlike the spiracles of the Muscidae; for as this insect passes its life in the suffocating atmosphere of a woolly back, it wanted every facility for inhaling the necessary oxygen, and therefore has many more spiracles, and of much less complicated form than the house-fly and its brethren. These circular spiracles dilate and contract, the cilia shorten by a muscular contraction at their base, and leave a perfectly open space.

Having briefly noticed the external structure of the Melophagus, we shall be inclined to take a fresh specimen and examine its internal anatomy; a little patient dissection will give us two very interesting observations. First, with regard to the alimentary canal. Opening the Melophagus with dissecting scissors under water, the whole will float out, and show the oesophagus, the convolutions of the intestine, the salivary glands, hepatic vessels, and some internal appendages, which, with a higher power, we must now observe.

This requires nice management of the dissecting needles to open the enlarged part of the rectum, on which are four small dots called by Dufour "*Les boutons charnus*." They mark the position of four internal papillae found in most of the Diptera, but with a modification in the Melophagus. They are slightly mentioned by Owen in his Lectures on Comparative Anatomy, but no observation is particularly made of the Melophagus, in which the papillae, instead of being smooth, are covered with short spines.

These singular organs are supplied with a branch of tracheal vessels and strong muscles; they evidently work freely in the interior of the rectum, and assist in the expulsion of the faecal matter. Probably, as the Melophagus is eminently sedentary in its habits, these additional spines act as whisks and brooms to clear the way where the muscular contractions are less powerful and frequent; or they



may act as rakes and sieves to separate the passing atoms and assist in the function of absorption.

The next point of interest is the very remarkable system of reproduction, whereby these pupivorous flies are separated in rank from all the other Diptera. They are neither oviparous nor viviparous.

The female nourishes a single egg within her body, attached to her by an *umbilical cord*, which egg, in its early stage, possesses two small spiracles situated at its base, by which air is conveyed to the pulpy substance within, from an *open* aperture in the abdomen of its mother. As the pupa progresses, eighteen spiracles develope on the surface of the skin, small dots, covered apparently with a transparent membrane until the hour of its expulsion, when each tiny window flies open, and the innumerable coils of trachea expand and contract under the rush of life-giving air.

The pupa case is brown and hard, lies loosely amongst the wool; the shepherds call them "eggs," but they are really the protecting case of a young *Melophagus*.

At the anterior end of the pupa is a slightly-marked seam, indicating the aperture by which the fly will come forth. In the *Melophagus*, as in the common dung-fly (*Scatophaga*), I observe a very distinct *ptilinum*, which is a soft, elastic membrane the insect is able to inflate, and wherewith it pushes open the lid of its pupa-case; moreover, the abdomen has something of the same kind, probably to push against its case, and further assist its exit.

From these few observations I think we may look with interest, if not with admiration, on the common sheep-tick, and as a whole mounted insect, it is both easy to prepare, and very satisfactory as an object for the polariscope, or for study of the legs, spiracles, and suctorial apparatus.

---

## CRITICAL AND EXPLANATORY COMMENTS ON THE NEW PHARMACOPŒIA,

INDICATING THE EXTENT AND CHARACTER OF THE CHANGES MADE, AND THE  
RELATIVE VALUE OF THE NEW AND OLD PROCESSES AND PREPARATIONS.

(From the *Lancet*, January 16, 1864.)

THE announcement of the completion of the British Pharmacopœia will be received with interest by the whole medical profession of Great Britain. It has been known for some years that this work was in preparation by a medical congress gathered from the three divisions of the kingdom, and great expectations have been formed of the result of their labours. The British Pharmacopœia is one of the most noticeable results of the Medical Act of 1858, and it is probably one of the most useful. Hitherto the right of publishing the Pharmacopœia for England, Scotland, and Ireland, have been vested in the Colleges of London, Edinburgh, and Dublin, respectively. That right has now been conferred upon the Medical Council of the entire kingdom, and the absurdity of three different Pharmacopœias in the British Isles is at an end. It is doubtful whether a national Pharmacopœia would ever have been obtained from the independent efforts of the three Colleges. Whatever may have been the cause, it is certain that little or no attempt at common action was made by three bodies. In some cases, preparations which were accidentally the same in two Pharmacopœias were absolutely altered by one of the Colleges, apparently with a view to variety; and in the latest editions these unnecessary divergences are most apparent. In the times when an inhabitant of one division of the kingdom rarely visited another, these differences were not of much consequence; but in these days of rapid locomotion a prescription which to-day is made up in London may to-morrow be dispensed in Edinburgh. It therefore becomes a matter of great moment that there should be uniformity in the composition and strength of the preparations of which a remedy is compounded.



The time which has been occupied in fusing the opinions of the three Colleges into one harmonious whole may give some idea of the difficulty of inducing united action amongst them in this matter. The Medical Act, which provided for one Pharmacopœia instead of the three previously existing, was passed in 1858 ; and the Committee are only now in a position to give the result of their labours to the world. The delay may, doubtless, be in some measure attributed to the clumsy expedient of having separate committees in London, Edinburgh, and Dublin, who had to exchange communications with each other on each difficulty which arose. Absolute identity of opinion was of course out of the question between the representatives of the three rival Colleges, so a process of voting was introduced. When any two committees managed to agree on a given point, the third was obliged to give way. This simplified matters a good deal, though, in some cases, it was for some time *quot comitia tot sententiæ*. We presume this difficulty will be avoided in the preparation of future editions. The British Pharmacopœia is only the culmination of attempts to obtain uniformity in medical formulæ.

An authorized Pharmacopœia is a comparatively modern idea. The first Pharmacopœia published under authority appears to have been that of Nuremberg in the year 1542. A young student named Valerius Cordus, who was staying for a short time at Nuremberg, showed a collection of medical receipts, which he had selected from the works of the most esteemed writers, to the physicians of that city. They thought it of so much value that they urged him to print it for the benefit of the apothecaries, and obtained the sanction of the Senate for the undertaking. Most of the chief cities of Europe followed this good example, London being amongst the last. The first edition of the London Pharmacopœia appeared in the reign of James the First, A.D. 1618—exactly a century after the incorporation of the London physicians as a privileged body in the reign of Henry the Eighth. Successive editions were established in 1610, 1697, 1721, 1746, 1787, 1809, 1824, 1836, and 1851. The Edinburgh Pharmacopœia is still more modern, the first edition having appeared in 1699, and the last in 1841. That of Dublin is an affair of the present century, the dates of the several editions being 1807, 1826, and 1850.

Before the publication of these authorised collections, the books chiefly in use among apothecaries were “Avicenna on Simples ;” “Serapion on Simples ;” “Simon Januensis de Synonymis” and his “Quid pro quo on Substitutes ;” “The Liber Servitoris” of Bulchasim ben Aberazerim, treating of the preparation of minerals, plants, and animals, similar to the chemical part of modern Pharmacopœias ; “The Antidotarium” of Johannes Damascenus, or Mezue, arranged in classes like the Galenical part of our present Pharmacopœias ; and “The Antidotarium” of Nicolaus de Salerno, containing these Galenical compounds, arranged alphabetically. This last was commonly called “Nicolaus Magnus ;” an abbreviated edition also existed called “Nicolaus Parvus.” For the rest, physicians who had some formula in which they put confidence communicated it to a confidential apothecary, of whom only it could be obtained. This practice, however, continued long after the introduction of legalized Pharmacopœias, and it is to be regretted that it is not yet extinct. Many of these nostra have survived to the present day, Daffy’s Elixir for example, prescribed by the physician whose name it bears in the reign of Charles II. It was upon the “Antedotarium” of Mezue and of Nicolaus de Salerno that the first edition of the London College, in May 1618, was chiefly founded ; but the first impression was immediately cancelled, in consequence of numerous errors, and a new edition published in the following December. Slight modifications were also introduced in 1627 and 1635 ; although some improvements were made, no great alterations took place till 1721. The successive editions of the London Pharmacopœia form quite a history of the progress of medicine and pharmacy, and by the aid of these volumes we may trace the gradual emergence of medicine from the state of blind superstition and foggy empiricism in which it appears to have been at the close of the sixteenth century. We select a few formulæ from the first two or three editions, which will illustrate the condition of medical science about the first half of the seventeenth century.



One of the most striking characteristics of the early Pharmacopœias is the excessively complex nature of the formulæ. They contain, on an average, some twenty ingredients. In some cases this was carried to an absurd degree. The first London Pharmacopœia contained an electuary called "Mathiolus his great antidote against Poison and Pestilence," which consists of a jumble of no less than 124 different substances. This was just twice as bad as Theriaca Andromachi (from the same Pharmacopœia), which contained 62. In some cases this passion for huge formulæ increased instead of diminishing as successive editions of the Pharmacopœia appeared. In 1650 Mithridate (Athanasia Mithridatis) consisted of 14 ingredients, but in 1787 of no less than 50. The materia medica of the seventeenth century would astonish a modern student. We find enumerated—wood-lice, toads, little puppy dogs, frogs, land scorpions, and foxes, the skull of a man killed by violent death, the inner skin of a hen's gizzard, the blood of a cat, the urine and excrements of various animals, &c., &c. The form in which these materials enter into the composition of medicines is sometimes very curious:—

P.L., 1650. "*Aqua et Spiritus Lumbricorum*.—℞. Earth-worms, well clensed, three pounds; snails with shells on their backs, clensed, two gallons. Beat them in a mortar, and put them into a convenient vessel, adding—stinging-nettles, roots and all, six handfuls; wild angelica, four handfuls; brank ursinæ, seven handfuls; agrimony, bettony, of each three handfuls; rue, one handful; common worm-wood, two handfuls; rosemary flowers, six ounces; dockroots, ten ounces; roots of sorrel, five ounces; turmeric, the inner bark of barberies, of each four ounces; fenugreek seeds, two ounces; cloves, three ounces; hartshorn, ivory in gross powder, of each four ounces; saffron, three drams; small spirit of wine, four and a half gallons. After twenty-four hours' infusion, destil them in an alembick."

P.L., 1650. "*Oleum catellorum* (oil of puppy dogs).—℞. Salad oil, four pounds; two puppy dogs newly whelped; earthworms washed in white wine, one pound. Boyl the whelps till they fall in pieces; then put in the worms; a while after strain it; then with three ounces of cypress turpentine, and one ounce of spirit of wine, perfect the oyl according to art."

P.L., 1650. "*Oleum vulpinum* (oil of foxes).—Take a fat fox of middle age (if you can get such a one<sup>1</sup>), caught by hunting about autumn; cut in pieces, the skin and bowels taken away, the bones broken; boyl him (scumming it diligently) in white wine and spring water, of each six pounds, till half be consumed, with three ounces of sea salt, the tops of dill, thyme, and chamepitys, of each one handful; after straining, boyl it again with four pounds of old oyl, the flowers of sage and rosemary, of each one handful; the water being consumed, strain it again; keep the pure oyl for use."

Many of the complex formulæ of early times appear to have been caused by the baneful classification of the simples into hot and cold, and these again into degrees, &c., and the supposed similarity of action of certain substances led the early pharmacologists to accumulate the collective action of these into one compound. This practice of piling Pelion upon Ossa landed them in such preparations as Theriaca Andromachi, which retains its place in very modern Pharmacopœias, and was only rejected eventually by the London College by 14 votes against 13. The influence of Galen thus seems to have made itself felt almost to our own times. He divided medicines according to four supposed qualities—heat, cold, moisture, and dryness, and these again into four degrees. It will be easily seen how a belief in such a fancy must have multiplied the list of inert articles in the materia medica. From this source we may trace the introduction of an extensive list of different seeds into practice. It is not long since medical writers descanted on the virtues of the four greater and lesser hot and cold seeds; and in the London Dispensatory of 1721, we find the hot and cold compound powders of pearl. Opium, being cold

<sup>1</sup> On this sentence, Culpeper, who loses no opportunity of having a fling at the College of Physicians, remarks—"That was well put in. Therefore, when you have caught a fox, bring him alive to the Colledg, and let them look in his mouth first, and tel you how old he is, so shal your oyl be *cum privilegio*."



in the fourth degree, required something hot to moderate its frigidity. The Edinburgh Pharmacopœia has omitted the Jamaica pepper in the *pilulæ opiatæ*, which evidently owed its origin to the Galenist.

It was to the improvements in chemical science that these theories owed their gradual displacement, and the effect of this advance in scientific knowledge became very apparent in the Pharmacopœia of 1788, in which the Galenical compositions were generally greatly simplified. Some steps in this direction were also taken in the edition of 1746. Great care seems to have been employed in the compilation of the edition of 1809. A specimen edition of 250 copies was printed in 1808, and circulated amongst those thought qualified to give an opinion. Only 60 of these were returned, but from these much valuable information was gained. A second specimen was then repaired and circulated amongst the Fellows resident in London, to be returned in like manner. The final report was made March 25th, 1809, and the Pharmacopœia ordered to be published. It was remarkable for the entire adoption of the nomenclature of Lavoisier. The Pharmacopœia of 1824 differs slightly from that of 1809, of which a corrected impression was issued in 1815.

In the Pharmacopœia of 1836 still greater efforts were made to keep pace with the progress of chemical science. As might be expected, in several instances the attempt to be very scientific in the nomenclature led to some confusion; and it was found necessary to change the names once more in the edition of 1851. In this, the latest edition of the College Pharmacopœia, a step was taken which relieved the book of much cumbrous matter. All those chemical preparations which require to be made up on the large scale were placed in the *Materia Medica*, but tests were given by which their purity might be ascertained. It is idle to give elaborate processes for the production of preparations which are always obtained from manufacturers who disregard the directions of the Pharmacopœia altogether. The Pharmacopœial directions are intended for operations on a small scale; and the practical experience of the manufacturers enables them to improve on these processes. In fact, the makers who are to be taught know far more about the matter than the authors of the Pharmacopœia who profess to teach. Provided a preparation is obtained which fulfils all the Pharmacopœial requirements, the process of manufacture is immaterial. We regret to find that in the new British Pharmacopœia the opposite plan has been adopted; these chemical substances being brought back into the body of the work, and much paper wasted by processes which will never be of the slightest use to the pharmacist.

On the formation of the Medical Council, the preparation of the British Pharmacopœia attracted its most earnest attention, and great care was taken to bring together those men best qualified for the task. Some time previous to the passing of the Medical Act, the College of Physicians had contemplated a new edition of their Pharmacopœia, and had invited the co-operation of the Pharmaceutical Society, who appointed a Committee for that purpose. A certain amount of information had therefore been obtained, which might be made available for the new work. Accordingly, when the committees of the Medical Council were appointed for London, Edinburgh, and Dublin, the College of Physicians and the Pharmaceutical Society were invited to send assessors to the London Committee. Dr Farre and Dr Garrod represented the College of Physicians; while Mr Squire appeared for the Pharmaceutical Society. Mr Warrington was requested to carry out some investigations in the laboratory of Apothecaries' Hall; but the Society was not represented on the Committee.

The work in hand was then parcelled out between the different committees, each undertaking to prepare a set of formulæ for a particular division of the book. The rough draught thus obtained was then sent to the other committees for approval, who made any alterations which appeared necessary. It was then referred back to the original authors, and as much as possible was agreed upon by correspondence: the rest was settled in a conference of the three committees, which took place from time to time. One important point excited a great deal of discussion—the weights and measures to be used. The troy or apothecaries'



weight had been used ever since the first edition of the London Pharmacopœia, and was universally employed in medicine throughout England, Scotland, and Ireland. But in the last edition of the Dublin Pharmacopœia in 1850 these weights were abandoned, and the avoirdupois weights were adopted. This was done to make the weights (of water) agree with the imperial measure, which had been universally adopted some time before. This system is not free from inconvenience, as the ounce, which contains 437·5 grains, could not be divided into drachms and scruples without getting into very awkward fractions of a grain. Notwithstanding this, this system found many advocates, and has been finally adopted by the Medical Council. A proposition of Dr Wilson, of Edinburgh, for making a new grain, of which the avoirdupois ounce should contain 480, was rejected after much discussion. It appears that the grain was too sacred a thing to tamper with, but that there was no objection to altering the ounce. The logic of this argument is hardly apparent. The French metrical system was not without its advocates, and at one time it was actually admitted into the new Pharmacopœia, though it was subsequently struck out, which many think a matter for regret. The next point was the language. The London Pharmacopœia has always been published in Latin, and in former times the College strongly objected to its publication in English. They were so angry with Culpeper for translating it, that they refused him a licence to practise, and thus converted him into a bitter enemy. The translations, however, throve and commanded a far more extensive sale than the classical original; and, after some resistance, the College determined to translate their own Pharmacopœia, and appointed an authorised translator (Mr Phillips) for the purpose. The absurdity of publishing a work in Latin and then translating it for the purpose of general sale, combined with the fact that the Edinburgh and Dublin Colleges had abandoned the Latin edition, settled the question. The new Pharmacopœia is in English, but with Latin names for the preparations only.

The names of the members of the Medical Council are printed at the commencement of the book, but many of them took but little part in the preparation of the work. We believe that in Edinburgh the chief members of the Committee were Drs Christison, Wood, Wilson, and Maclagan; in Dublin, Drs Apjohn, A. Smith, and Neligan; while in London the work devolved almost entirely on the assessors who were called in to assist the Committee, Drs Farre and Garrod, and Mr Squire. In fact, after a little time no other member of the London committee attended.

The volume will shortly, we trust, be in the hands of our readers, and we shall then proceed to consider in detail its merits and its deficiencies. Meantime some idea may be formed of the nature and extent of the changes made by the following list, which we have somewhat hastily drawn up, showing the new preparations which are contained in the Pharmacopœia, those which are continued in new forms and under altered names, and those which have been altogether discarded.

<i>Old Names.</i>	<i>New Names.</i>	<i>Old Names.</i>	<i>New Names.</i>
Acetum Britannicum.	Acetum Gallicum.		Infusum cusso.
	Acid. sulphurosum.		„ dulcamaræ.
Antim.-pot. tartras.	Antimonium tartrat.		„ ergotæ.
Mistur. camphoræ.	Aqua camphoræ.		„ matico.
	Catechu nigrum.		„ senegæ.
	„ pallidum.	Infusum sennæ co.	„ sennæ.
	Confectio sulphuris.		„ uvæ ursi.
	„ terebinth.		Liniment. aconiti.
	Extract. ergotæ liquid.		„ belladonnæ.
	„ opii. liquid.		„ cantharidis.
	„ pareiræ liquid.		„ chloroform.
	Ferri sulphas granulat.		„ crotonis.
Hydrarg. amon. chlor.	Hydrargyr. ammoniat.		„ iodii.
„ nitrico oxyd.	„ oxyd. rubr.		„ terebinth. acet.
Infusum aurant. co.	Infusum aurantii.	Liq. potass. arsenit.	Liquor arsenicalis.
„ catechu co.	„ catechu.		„ atropiæ.



<i>Old Names.</i>	<i>New Names.</i>	<i>Old Names.</i>	<i>New Names.</i>
	Liq. calcis saccharat.		Suppositor morphiæ.
	„ hydrarg. nitrat. acid.		Syrup. hemidesmi.
	„ potassæ permangan.	Syr. Rosæ.	„ rosæ gallicæ.
	„ sodæ arseniatis.		Tinct. bucco.
Liq. sodæ chlorinata.	„ sodæ chloratæ.	Tinct. camphor. co.	„ camphoræ c. opio.
	„ strychniæ.	„ catechu co.	„ catechu.
Mistura creosoti.	Mucilago acaciæ.	„ colchici.	„ colchici semin.
	„ scammonii.	„ conii.	„ conii fruct.
Mistura acaciæ.	„ amyli.	„ sesquichlor.	„ ferri perchlor.
	„ tragacanthi.	„ iodinii co.	„ iodinii.
Myristicæ oleum.	Myristicæ adeps.		„ sabinæ.
	Pil. aloes Barbadoes.		„ senegæ.
	„ socotrin.	„ sennæ co.	„ sennæ.
	„ et assafoetid.	„ valerianæ co.	„ valerian. ammon.
Pil. galbani co.	Pil. assafoetidæ co.		Trochisci acidi tannici.
	„ calomel co.		„ bisnuthi.
	„ colocynth et hyoscyam.		„ catechu.
Pil. ferri co.	„ ferri carbon.		„ morphiæ.
	„ „ iodidi.		„ morph. et ipecac.
Pil. saponis co.	„ opii co.		„ opii.
	„ potassæ permangan.		Ungt. aconiti.
Potassæ bitart.	Potassæ tartras acid.		„ atropiæ.
Pulv. cinnam. co.	Pulvis aromaticus.		„ calomel.
	„ catechu co.		„ cocculi.
Pulv. cretæ co.	„ cretæ aromat.	Ungt. hydr. am. chlor.	„ hydrarg. ammoniati.
„ „ c. opio.	„ „ aromat. c. opio.	„ hydr. iodidi.	„ „ iodid. rubr.
„ ipecac. co.	„ ipecac. c. opio.	„ „ nitric. oxyd.	„ „ oxyd. rubr.
„ kino co.	„ kino c. opio.		„ plumbi carbonat.
	„ rhei co.		„ „ subacet.
	Spirit. cajuputi.	Cerat. resinæ.	„ resinæ.
Chlorie ether.	„ chloroformi.		„ simplex.
	„ juniperi.		„ terebinthinæ.
	Succus conii.	Ungt. zinci.	„ veratriæ.
	„ scopariæ.	Vin. antim. pot. tart.	„ zinci oxidi.
	Suppositor. acidi tanici.		Vin. antimoniale.
			Zinci valerianas.

At present we have Tinct. iodinii comp. and Tinct. iodinii. The first contains spirit, iodine, and iodide of potassium. The Tinct. iodinii contains simply iodine and spirit. The present name, Tinct. iodi, containing iodine, iodide of potassium, and spirit, will cause confusion.

#### LIST OF ARTICLES INCLUDED IN THE LAST LONDON PHARMACOPŒIA, AND OMITTED IN THE NEW PHARMACOPŒIA.

Absinthium, Ærugo, Aloe hepatica, Althæa, Anisum, Avena, Calamina præparata, Calcii chloridum, Canella, Carota, Chimaphila, Cornu, Cornu ustum, Cydonium, Cuminum, Farina, Ferrum in fila tractum, Granatum, Helleborus niger, Inula helenium, Juniperus, Lactuca, Laurus, Manganesii binoxidum, Maranta, Mentha piperita, Mentha viridis, Morphiæ acetas, Mucuna, Ovi albumen, Ovi vitellus, Panis, Petroleum, Piper longum, Pix (Pix nigra), Potassii ferrocyanidum, Potassii sulphuretum, Pulegium, Pulegii oleum, Pyrethrum, Rhamni sucus, Ruta graveolens, Sagapenum, Sago, Spiritus vini gallici, Staphisagria, Terebinthina chio, Ol. tigii, Tormentilla, Veratrum album, Viola, Acetum distillatum, Acet. cantharidis, Acet. colchici, Acet. scillæ, Ol. æthereum, Spiritus ætheris compositus, Liq. ammoniæ citratis, Liq. ammoniæ sesquicarbonatis, Atropiæ sulphas, Aquæ pulegii, Cerata, Confectio aurantii, Conf. cassiæ, Conf. opii, Conf. rutæ, Decoctum chimaphilæ, Dec. cinchonæ pallidæ, Dec. cinchonæ rubræ, Dec. Cydoniæ, Dec. dulcamaræ, Dec. gallæ, Dec. granati, Dec. hordei compositum, Dec. senegæ, Dec. tormentillæ, Dec. Ulmi, Dec. uvæ ursi, Emplastrum ammoniasi, Empl. cumini, Empl. potassi iodidi, Enema colocynthidis, Extractum cinchonæ pallidæ, Extr. cinchonæ rubræ, Extr. lactucæ, Extr. papaveris, Extr. pareiræ, Extr. uvæ ursi, Infusum armoraciæ compos., Inf. aurantii compos., Inf. cinchonæ pallidæ, Linimentum æruginis, Lin. ammoniæ sesquicarbonatis

Mel. rosæ, Oxymel scillæ, Liq. albuminis compositum, Liq. arsenici chloridi, Cupri ammonio-sulphas, Liq. cupri ammonio-sulphatis, Ferri ammonio-chloridum, Tinc. ferri ammon.-chlor., Hydrargyri oxidum, Hydrarg. bisulphuretum, Plumbi iodidum, Potassa cum calce, Liquor potassæ carbonatis, Potassii sulphuretum, Liq. potassii iodidi compos., Mistura gentianæ compos., Mist. spirit. vini gallici, Pilul. aloes cum sapone, Pilul. conii compos., Pilul. ipecac. cum scilla, Pilul. styracis compos., Pulvis aloes compos., Spiritus ammoniæ foetidus, Spir. anisi, Spir. carui, Spir. cinnamomi, Spir. menthæ viridis, Spir. pimenti, Spir. pulegii, Sulphuris iodidum, Syrupus althæa, Syr. cocci, Syr. rhamni, Syr. sarsæ, Syr. violæ, Tinctura aloes comp., Tinct. ammon. comp., Tinct. cinchona pallidæ, Tinct. cinnamoni comp., Tinct. colchici comp., Tinct. cubebæ, Tinct. hellebori, Vinum veratri, Ungt. conii, Ungt. hydrarg. nitrat. mitius, Ungt. opii, Ungt. picis, Ungt. picis liquid., Ungt. plumbi compos., Ungt. plumbi iodid., Ungt. sambuci, Ungt. sulphuris compos., Ungt. sulphur. iodid.

---

## TAR AND BUTTER.

(*From the Scottish Farmer, December 2, 1863.*)

A PROPRIETOR in Morayshire informs us of a heavy mortality amongst his sheep. He smeared his flock, and 6 per cent of the animals of all ages succumbed. This has been attributed to bad tar; but from other sources there are rumours of deaths, where the tar is said to have been of the best quality—some think too good and too strong. What paradoxes! They are not, however, irreconcilable, as it is neither the badness nor the goodness of tar which injures—it is the entire application of grease, butter, and tar in combination. We should not have recurred to this subject at present had it not been for the purpose of asking the farmer to supply us with information on a subject of vital interest to the flockmaster in these days of fabulous prices for raw materials wherewith to clothe our people. Is it, or is it not, profitable to smear with tar and butter? The percentage of death being annually considerable, has the farmer a compensating advantage in the extent to which the smeared flock is generally preserved in health and the fleeces increased in weight? Are substitutes not to be had which will answer every purpose of tar and butter at a less cost, and with the advantage of not killing? Some of the most enlightened flockmasters have given up the tar and butter for oils, and with great advantage. Our experience of oil as yet has been most favourable, and we have examined sheep during the past week which had been dressed with oil, and found them free from vermin, and with a fleece which seemed to have every appearance of being sufficiently charged with fatty matters to prevent the penetration of rain to the skin. Other preparations of a pure white and cream colour have suggested themselves to us, which have the advantage of a considerable degree of firmness at the temperature of an animal's skin, and which may readily be made to pass over the whole surface. If any farmer is desirous of aiding in experiments to determine how best to dress sheep with a view to counteract the losses in various ways at present incurred, we shall be only too glad of their co-operation, and in the meantime we have to ask for further statistics as to losses. Of one thing we are certain, that salt and rancid butter is injurious to the skin and wool. Every particle of tainted fat should be purified by melting and pouring through it a quantity of warm water rendered slightly alkaline. Even this simple process is, however, too troublesome for the farmer, and it were well if smearing materials were more carefully prepared and rendered fit for use without giving extra trouble to the consumer.



## ON A CASE OF TRICHINAL INFECTION.

BY PROFESSOR LANGENBECK.

WHILE removing a cancrioid growth from the neck of a patient arrived from the country, Dr Langenbeck remarked that the platysma presented an unusual appearance. Microscopic examination showed that it contained an immense number of dead trichinæ, contained in calcified capsules. Inquiry was made as to the circumstances under which the immigration had probably occurred, and the following was the result :—In 1845, a commission composed of eight persons went to a town in the district of Lansitz to inspect the schools. A collation composed of ham, sausages, cheese, roast veal, and white wine having been served to the commission, only seven of the members partook of it, the eighth was absent at the time, and only took a glass of red wine at the dessert. Three or four days afterwards the seven who had partaken of refreshments were seized with intense diarrhœa, pain in the neck, and œdema of the face and extremities. In four the attack proved fatal ; and three others, including the individual on whom M. Langenbeck had operated, only recovered after a tedious illness. Rumours of poisoning spread about, as may readily be imagined. An investigation was ordered, but the result was negative ; the public, however, did not so readily get quit of their suspicions, and the landlord of the hotel where the collation had been served soon found himself without customers, and was obliged to emigrate. Facts of this nature are well worthy the attention of medical jurists.—*Deutsche Klinik*.

## THE PAST AND PRESENT OF THE IRISH TURF, AND ITS EFFECTS ON BREEDING.

By "BEACON" (late of "BELL'S LIFE.")

"Pars sanitatis velle sanari fuit."

"To yield to remedies is half the cure."

IN this age of observation and inquiry it is not a little strange that the continually decreasing number of horses bred in Ireland, as well as their general deterioration should have remained, if not unnoticed, at least unregarded, until a month or two ago, when the subject was taken up by the Royal Irish Agricultural Society in a spirit that does that body credit, and from which the best results may be anticipated. The report which the members of the sub-committee undertook to prepare has not yet been promulgated, consequently it is only possible to surmise the remedial measures they intend to recommend ; but from the discussion carried on at a subsequent meeting of the Society, it would appear that there is a probability of their adopting the suggestion made by our correspondent "SKYLARK," a week or two ago, by advising the establishing of a stud farm in the neighbourhood of the Curragh. That "the future is purchased by the present," is an old axiom, and doubtless this would be a step in the right direction, but unless undertaken with spirit it will be productive of no immediate or permanent good, as many years must necessarily elapse before the beneficial effects of such an establishment would ramify through the country. Nor are companies the best means for arriving at the object intended ; for if in the conduct of mercantile business they are subject to disagreements which entail failure, it is not to be supposed that in a matter involving such a diversity of opinion as horse breeding they are likely to be attended with the desired success. Far better would it be if the resident noblemen and gentlemen of Ireland individually took an interest in upholding the national pastime as their fathers did of old, for it cannot be denied that to the decline of the Turf is mainly due the deterioration of the horses of the present day. Though lands have changed hands, and many of the old families who so long upheld the sports and pastimes, as well as the hospitalities of the Green Isle,

have passed away, yet enough remain to restore the ancient glories of the Curragh, when the meetings on that world-famed plain far superseded in interest any held in England—Newmarket alone excepted. Almost coeval with the establishment of racing at Newmarket, the Curragh could boast of its meetings, and so far back as the 15th of September 1751, Sir Ralph Gore's Othello (better known as Black and all Black), by Crab, beat Lord March's Bajazet, a son of the Godolphin Arabian, four miles, for 1000 guineas a side, a great sum in those days ; and that there was a still better horse in the country was proved three days subsequently by Sir Marmaduke Wyvill's Primate, a son of Belgrade the Second, beating Othello for the King's hundred, over the course. Nor was the above match a singular instance of the large sums run for even at that early period, for Heber's Calendar of that same year also records that Mr Marvin's Trifle walked over for a L.500 match at the April meeting, his opponent being dead. Thus, so far back as one hundred and thirteen years ago the best blood found its way into Ireland, and peers and commoners gave their hearty support to racing, as Lord Antrim, Lord Mazarine, Sir Edward O'Brien, Sir Ralph Gore, Sir Marmaduke Wyvill, Mr Hercules Langford Rowley (ancestor of the breeder of Sir Hercules), and many other gentlemen, kept, in the technical phrase of the day, "running horses." Sir Edward O'Brien (ancestor of the present Lord Inchiquin and Mr Smith O'Brien) is deserving of particular mention for having introduced the best blood, perhaps, ever brought into Ireland, as among other celebrities he imported Miss Patch, by Justice, from whom Bob Booty is descended, and, as a consequence, England is indebted to a Clare gentlemen for the best runners of the present day.

Some sixty years later, or in 1811, the next *Calendar* I happen to have by me, new actors appear upon the scene, including the Marquis of Sligo, the Marquis of Donegal, the Earl of Belmore, the Earl of Portarlington, Lord Rossmore, Earl of Clermont, the Right Hon. Denis Bowes Daly, Sir Wheeler Cuffe, Sir Charles Coote, Sir R. Butler, Sir D. O'Malley, Col. Lum, Col. Loftus, Col Bruen, Col. Vandeleur, Mr R. Hamilton, Mr R. Gore, Mr Battersby, Mr Kirwan, Mr M. G. Prendergast (after whom the race of that name at Newmarket is called), Mr John Whaley, Mr R. Hunter, Mr Jason Hassard, Mr Creed, Mr Mark Brown, Mr Edwardes, Mr Ormsby, Mr Bodkin, Mr Fitzmaurice Caldwell, Mr T. Conolly, Mr Giles Daxon, Mr Lane, Mr O'Ryan, Mr Dennis, *cum multis aliis*, names that will ever live in the annals of the Irish Turf. And how thorough-bred stock increased throughout the country is best told by the increase of the meetings, which, from thirteen in 1751, rose to thirty-one in the year above named, and at which three hundred and thirty-eight horses ran.

During the seven years preceding and the seven following this period, racing in Ireland reached its zenith, for Col. Lum having bought Champion, the first horse that ever effected the double victory for the Derby and the St Leger, his services as a sire, combined with those of Swordsman, Master Bagot, Commodore Buffer, Rugantino, Sir Walter, Fitz-Emily, Escape, Recorden, Washington, &c., raised a host of horses the equal of which are not now to be found in the British Isles. The principal "cracks" during these years were—

Friday, by Washington  
Hollyhock, by Master Bagot  
Master Robert, by Buffer  
Milesius, by Escape  
Nabocklish, by Rugantino  
Narcissus, by Bob Booty  
Norfolk, by Champion  
Pope, by Waxy

Pope, by Shuttle  
Poor Pat, by Pipes  
Queensberry, by Remembrancer  
Rainbow, by Walton  
Sir Roger, by Sir Walter  
Steersman, by Commodore  
Souvenir, by Recorden  
Wire, by Waxy

(To be continued.)



## THE DISEASES IN CATTLE.

*(From the Times.)*

SIR,—It would seem to be proved from the various communications you have distinguished yourself by publishing on this subject,—first, that pleuro-pneumonia, tongue, and foot disease, and other such affections, were not known in this country previously to the importation of foreign cattle; second, that those diseases are capable of being originated in all cattle by hardships, such as overcrowding, want of ventilation, undue exposure to the weather, scanty supplies of food and drink, and uncleanness; third, that once engendered they are contagious and easily communicated from diseased beasts to those which are well, by immediate contact on that of the morbid excretions, without the intervention of other causes; fourth, that in the days when cattle were driven to market on the common roads, such affections were less prevalent than they now are.

This view of the case corresponds in most respects with the natural history of what are called zymotic diseases in man, and especially with that of such affections as are exhibited in passenger and emigrant ships.

It has been found necessary to place by law vessels undertaking the conveyance of passengers of the emigrant class under special regulations, and to require them in that particular branch of naval trade to be provided with a license, which is only given to ships whose owners have complied with the regulations in question. According to those regulations, a certain amount of space and other accommodation, adequate supplies of food and water, according to the length of the voyage, superintendents properly qualified to recognise and enforce the conditions necessary for health, and a due provision of disinfecting agents and other sanitary articles, must be provided in proportion to the number of passengers or emigrants to be carried.

The greater prevalence of the diseases of cattle in question, which has been observed since the general use of railways and steamers in the conveyance of live stock, points to the growing necessity of regulation in that trade, similar to those which have been enforced in the case of all passenger and emigrant ships.

I would, therefore, suggest, that an Act of Parliament be passed making it compulsory for every sea-going vessel and railway train carrying cattle to be provided with a special license, to be granted on condition that certain regulations, calculated to maintain the health of live stock, shall be conformed to, under severe penalties.

Independently of the immense importance of securing the wholesomeness of one of the principal articles of public subsistence, considerations of a purely humane character call loudly for some legal restraint on the cruel and abominable practices which were so truthfully and forcibly delineated by your correspondent, "An Irish Bullock."

The Society for the Prevention of Cruelty to Animals could not possibly be better employed than in drawing up and promoting the enactment of such a law, which would not only prevent cruelty, but materially diminish profligate waste and injury to the public health. Let the Society in question see to it.—Your obedient servant,

C.

---

 OBITUARY.

MR JAMES RAINSFORD, 4th Dragoon Guards.

MR H. A. TRUMAN, Old Sleaford, Lincoln.

# EDINBURGH VETERINARY REVIEW

AND

## Annals of Comparative Pathology.

---

### ORIGINAL COMMUNICATIONS AND CASES.

---

*The Quality of Meats.* By Professor CHARLES A. CAMERON, Ph.D., M.D., M.R.I.A., Honorary Member of the Agricultural Societies of New York, Belgium, &c., Analyst to the City of Dublin.

THE flesh of herbivorous animals is composed of muscular and adipose (fatty) tissues. The muscles consist of bundles of elastic fibres (*fibrine*), enclosed in an albuminous tissue formed of little vessels, termed cells, and intimately commingled with water, and a mixture of albuminous, fatty, and saline matters. The leanest flesh (muscle) contains fat, but the latter accumulates in certain parts of the body—often to such an extent as to seriously interfere with the functions of life. The red colour of flesh is due to a rather large proportion of blood, which it contains in minute vessels; and the slight acidity of its juice is owing to the presence of *inosinic* acid, and probably of several other acids. The agreeable odour of meat, when it is subjected to the process of cooking, is developed from a complex substance termed *osmazome*.<sup>1</sup> This constituent varies in nature and quantity in the different animals—hence the variety in the flavour and odour of their flesh—and its amount increases with the age of the animal. The albumen of the muscles, and their fatty and saline constituents, are digestible; but it is generally believed that the elastic fibres, and the horny cellular tissue which binds them into bundles, are not assimilable. It is more certain that the crystalline substances found in flesh—such as, for example, *kreatine*—are incapable of ministering to the nutrition of animals.

The composition of flesh varies considerably; that of an obese pig contains more than half its weight of fat, whilst the jerked beef recently imported from South America yields scarcely 5 per cent. of that substance. Young meat is richer in soluble albumen and poorer in fibrine and fat than the matured flesh of the same animal. The flesh of the goat contains *hircic* acid, which renders it almost uneatable, but this substance is either altogether absent from, or

---

<sup>1</sup> From two Greek words signifying odour and soup.



present but in minute proportion in, the well-flavoured meat of the kid. The flesh of game contains abundance of osmazome, a substance which is somewhat deficient in that of the domestic fowl.

Owing to the marked individuality which man exhibits in the selection of his food, and to the intimate relationship subsisting between food and the organism it nourishes, it is impossible to arrange the alimential substances in the strict order of their nutritive values. You can bring a horse to the water, but you cannot compel him to drink it; you can swallow any kind of food you please, but you cannot force your stomach to digest it. It is therefore vain to tell a man that a certain kind of food is shown by chemical analysis to be nutritious, when his stomach tells him unmistakably that it is poisonous, and refuses to digest it. In the matter of dietetics Nature is a safer guide than the chemist. Many substances, when viewed only in the light shed upon them by chemical analysis, appear to be rich in the elements of nutrition, yet when they are introduced into the stomachs of certain individuals, they disarrange the digestive organs, and sometimes cause the whole system to go out of order. Every day we see exemplified the truth of the proverb that "one man's meat is another man's poison." There are persons who relish and readily digest fat pork, and yet they cannot eat a single egg with impunity; others enjoy and easily assimilate eggs, but their stomachs cannot tolerate a particle of fat.

It is not merely the composition of an aliment and its adaptability to the organism which determine its nutritive value—its digestibility and flavour are points which affect it. There are few people in these countries who are disposed to quarrel with beef; but no one would prefer the leg of an elderly milch cow to the sirloin of a well-fed three-year-old bullock: yet if our selection were to be determined by the analysis of the two kinds of beef, we would be just as likely to prefer the one as the other. No doubt the relative tenderness of meats may be ascertained by experiments conducted *outside* the body; but tenderness is not in every case synonymous with easy digestibility. Veal contains more soluble albumen, and is, consequently, far more tender than beef; yet, as every one knows, it is less digestible. It is curious that maturity renders the flesh of some animals more digestible, and that of others less digestible. Flavour has something to do with these differences. Beef is richer than veal in the agreeably odorous and flavorful osmazome; and the flesh of the kid is destitute of the disagreeable odour of the fully-developed goat. The superiority of wild fowl over the domesticated birds is solely owing to the finer flavour of their flesh.

Although the digestibility and flavour of meat (and of every other kind of food) affect its nutritive value, these points are in general of far less importance than its composition. Potatoes are not so nutritious as peas, because they contain a smaller amount of fat and flesh-formers; but they are more digestible. Fish contains less solid matter than flesh, and is less nutritious, yet a cut of turbot will be,

in general, more easily digested than an equal weight of old beef. The fact is, that digestibility and flavour are only of great importance to dyspeptic persons. In the healthy digestive organs a pound weight of (dry) food of inferior flavour and slow digestibility will be just as useful as the same weight of well-flavoured and easily-assimilable aliment, provided all other conditions be alike. If the food be eaten with a relish, and tolerated by the stomach, its digestibility will not, except in extreme cases, affect in a sensible degree its nutritiveness.

Were one question in animal nutrition satisfactorily answered, it would then be comparatively easy to arrange aliments in the order of their nutritive value. The question is—What are the proper relative proportions of the fat-forming and flesh-forming constituents of our food? It is constantly urged, that the food of the Irish peasantry contains an excess of the fat-forming materials in relation to the muscle-forming substances; and the remedy suggested is, that their staple article of food, potatoes, should be supplemented with flesh, peas, and such like substances, in which, it is supposed, the elements of nutrition are more fairly balanced. In potatoes, the proportion of fat-formers (calculated as fat) is about five times as much as that of the flesh-formers; but these principles exist in the same relative proportions in the fat bacon with which the potato-eater loves to supplement his bulky food. In bread we find the proportion of fat-formers to be only  $2\frac{1}{2}$  times as much as that of the flesh-formers; whilst according to Lawes and Gilbert the edible portion of the carcase of a fat sheep contains  $6\frac{1}{4}$  times as much fat as nitrogenous (flesh-forming) compounds. It is evident, then, that meat—such as, for example, the beef recently imported from Monte Video, from which the fatty elements of nutrition are almost completely absent—cannot be a suitable adjunct to a farinaceous food.

There is evidence to prove that in the animal food consumed by the population of these countries, the proportion of fatty to nitrogenous matters is greater than in the seeds of cereal and leguminous plants, and but little less than in potatoes. “It would appear to be unquestionable,” say Lawes and Gilbert, “therefore, that the influence of our staple *animal foods*, to supplement our otherwise mainly farinaceous diet, is, on the large scale, to *reduce*, and *not to increase*, the relation of the *assumed* flesh-forming material to the more peculiarly respiratory and fat-forming capacity, so to speak, of the food consumed.” It must be remembered, too, that the *fat-formers* are ready *formed* in animal food, whereas they exist chiefly in the form of starch, gum, sugar, and such like substances in vegetables. According to theory,  $2\frac{1}{2}$  parts of starch are equivalent to—*i.e.*, convertible into—1 part of fat; but it is not certain whether the force which effects this change is derivable from the  $2\frac{1}{2}$  parts of starch, or from the destruction of tissue, or of another portion of food. If there be a tax on the system in order to convert starch



into fat, it is evident that  $2\frac{1}{2}$  parts of starch, though convertible into, are not equivalent in nutritive value to one part of fat.

It is quite certain that millions of healthy, vigorous men have subsisted for years exclusively on potatoes; but it is no less clear that a diet of meat and potatoes enables the labourer to work harder and longer than if his food were composed solely of potatoes. But we have seen that the relation between the flesh-forming and fat-forming elements is nearly the same in both potatoes and meat; so that the superiority of a meat or mixed diet cannot be chiefly owing, contrary to the generally received opinion, to a greater abundance of flesh-forming materials. As the proportion of flesh-formers to fat-formers is so much greater in wheaten or oaten bread than in potatoes, and as peas and other vegetables rich in nitrogenous compounds are practically found to be an excellent supplement to potatoes, it is probable that the latter may be somewhat relatively deficient in flesh-forming capacity. It is, however, in all probability the great bulk of a potato diet, and its total want of ready-formed fat, that render the addition to it of animal food so very desirable. The concentrated state in which the ingredients of flesh exist, the intimate way in which they are intermixed, their agreeable flavour, and their (in general) ready and almost complete digestibility, appear to be the principal points in which a meat diet excels a vegetable regimen. There may be others which, though less evident, perhaps, are of equal, if not greater, importance. At all events, the general experience of mankind testifies to the superiority of a mixed animal and vegetable diet over a purely vegetable one.

The enormous and rapidly increasing demand for meat which characterises the food-markets of these days, has reacted in a remarkable manner upon the nature of the animals that supply it. Formerly the animals that furnished pork, mutton, and beef, were allowed to attain the age of three years old and upwards before they were considered to be 'ripe' for the butcher: but now sheep and pigs are perfectly *matured* at the early age of one year; and two-year-old oxen furnish a large quota of the "roast beef of old England." The so-called improvement of stock is simply the forcing of them into an unnatural degree of fatness at an early age; and this end is attained by dexterous selection and crossing of breeds, by avoidance of cold, by diminishing as much as possible their muscular activity, and lastly, and chiefly, by over-feeding them with concentrated aliments.

Every one knows that a man so obese as to be unable to walk cannot be in a healthy state; yet many feeders of stock look upon the monstrously fat bulls and cows of cattle-show prize celebrity as normal types of the bovine tribe. It requires but little argument to refute so fallacious a notion. No doubt it is desirable to encourage the breeding of those varieties of animals which exhibit the greatest disposition to fatten, and to arrive early at maturity; but the forcing of individual animals into an unnatural state of obesity,

except for purely experimental purposes, is a practice which cannot be too strongly deprecated. If breeders contented themselves with handing over to the butcher their huge living blocks of fat, the matter would not, perhaps, be very serious; but unfortunately it is too often the practice to turn them to account as sires and dams. Were I a judge at a cattle show I certainly should disqualify every extremely fat animal entered for competition amongst the breeding stock. Unless parents are healthy and vigorous, their progeny are almost certain to be unhealthy and weakly; and it is inconceivable that an extremely obese bull and an unnaturally fat cow, could be the progenitors of healthy offspring. We should by all means improve our live stock; but we should be careful not to overdo the thing. If we must have gaily-decked ponderous bulls and cows at our fat cattle exhibitions, let us condemn to speedy immolation those unhappy victims to a most absurd fashion; but in the name of common sense let us leave the perpetuation of the species to individuals in a normal state, whose muscles are not replaced by fat, whose hearts are not hypertrophied, and whose lungs are capable of effectively performing the function of respiration.

Mr Gant, in a small volume\* devoted wholly to the subject, describes the serious functional and structural disarrangements which over-feeding produces in stock. He found the heart of a one-year old Southdown wether, fattened according to the *high-pressure system*, to be little more than a mass of fat. In several other young, but so-called "matured" sheep, he found more or less fatty degeneration of the heart, and extensively spread disease of the liver and of the lungs. A four-year-old Devon heifer, exhibited by the late Prince Consort at a Smithfield show, was found to be in a highly diseased state. It was slaughtered, and of course its flesh sold at a high price as "prize beef," but its internal organs came into Mr Gant's possession. The substance of both ventricles of the heart had undergone all but complete conversion into fat; one of its muscles was broken up, and many of the fibres of the others were ruptured. In another animal the muscular fibres of the heart had given way to so great an extent that if the thin lining membrane (*endocardium*) had burst, death would have instantly ensued. The slightest exertion was likely to cause this catastrophe; but, fortunately enough in this case, the animal was not capable of exertion, for though under three years of age, it weighed upwards of 200 stones. This animal had received for some time before its exhibition, the liberal allowance of 21 lbs. of oil-cake (besides other food) per diem. 'A pen of three pigs,' says Mr Gant, 'belonging to his Royal Highness the Prince Consort, happened to be placed in a favourable light for observation, and I particularly noticed their condition. They lay helpless on

---

\* A New Inquiry, fully illustrated by coloured engravings of the heart, lungs, &c., of the diseased prize cattle, lately exhibited at the Smithfield Cattle Club, 1857. By Frederick James Gant, M.R.C.S. London, 1858.



their sides, with their noses propped up against each other's backs, as if endeavouring to breathe more easily, but their respiration was loud, suffocating, and at long intervals. Then you heard a short catching snore, which shook the whole body of the animal, and passed with the motion of a wave over its fat surface, which, moreover, felt cold. I thought how much the heart under such circumstances must be labouring to propel the blood through the lungs and throughout the body. The gold medal pigs of Mr Moreland were in a similar condition, if anything worse, for they snored and gasped for breath, their mouths being opened, as well as their nostrils dilated, at each inspiration. From a pig we only expect a grunt, but not a snore. These animals, only twelve months and 10 days old, were marked "*improved* Chilton breed." They, with their fellows just mentioned, of 11 months and 23 days, had early come to grief. Three pigs of the black breed were in a similar state, at 7 months 3 weeks and 5 days, yet such animals "the judges highly commended."

There is conclusive evidence to prove that one of the effects of the present mode of fattening beasts, is disease of the internal organs of the animals; but it is by no means certain that the flesh of those diseased animals is unwholesome as food, as some writers assert it to be. The flesh of an over-fattened animal differs from that of a lean, or moderately fat one, in containing an exceedingly high proportion of fat; but it has not been proved that the fat of prize animals differs from the fat of lean kine, or that it is less wholesome or nutritious. Be the flesh of those exceedingly fat animals unwholesome or not, there are thousands, aye, millions of persons, to whom its greasy quality renders it peculiarly acceptable; and as for those who dislike fat, they do not usually invest their money in the flesh of prize sheep or oxen. At the same time it must not be understood that all, or even a large proportion of fully matured stock is in a diseased state; though in most of them the vital and muscular powers are undoubtedly exceedingly low.

The habits of animals, and the nature of their food, affect the quality of their flesh. Exercise increases the amount of osmazome, and consequently renders the meat more savory. The mutton of Wicklow, Wales, and other mountainous regions, is remarkably sweet, because the animals that furnish it are almost as nimble as goats, and skip from crag to crag in quest of their food. The fatty mutton, with pale muscle, which is so abundant in our markets, is furnished by very young animals forced prematurely into full development. Those animals have abundance of food placed within easy reach, and their muscular activity is next to *nil*; the result is, that their flesh contains less than its natural proportion of savoury ingredients. It is the same with all other animals. The flesh of the tame rabbit is very insipid, whilst that of the wild variety is well flavoured. Wild fowls cooped up, and rapidly fattened, lose their characteristic flavour; and when the domesticated birds become wild, their flesh becomes less fatty, and acquires all the peculiarities of game. Ducks, whether

wild or tame, ordinarily yield goodly meat; but the flesh of some of them that feed on fish smacks strongly of cod-liver oil. Birds which subsist partly on aromatic berries assimilate odour as well as the nutriment of their food. The flesh of grouse has very commonly a slight flavour of heather. Foster states that in Tahiti pigs are fed upon fruits, which renders their fat very bland and their flesh like veal. Animals subjected to certain kinds of mutilation fatten more rapidly than they do in their natural state. Capons increase in weight more rapidly than cocks, poulards than hens, bullocks than bulls, and cows deprived of their ovaries, than perfect cows. Why it is that the flesh of mutilated animals should be fatter and more tender than that of whole animals, we know not; we only know that such is the fact. The hunting of animals renders their flesh more tender; the cause assigned is, that the great exertion of the muscles liquifies their fibrine, which is the toughest of their constituents. The meat of animals brought very early to maturity is seldom so valuable as the naturally developed article. Lawes and Gilbert state that portions of a sheep that had been fattened upon *steeped* barley and mangels, and which gave a very rapid increase, yielded several per cent. less of cooked meat, and lost more, both in dripping and by the evaporation of water, than the corresponding portions of a sheep which had been fed upon *dry* barley and mangels, and which gave only about half the amount of gross increase within the same period of time.

There is no doubt but that sheep and oxen, from three to five years old, moderately fat, and fairly exercising their locomotive powers, furnish the most savoury, and, perhaps, the most nutritious meat; but if such were the only kind of meat in demand, it may be fairly doubted that the supply would be equal to it. The produce of meat in these countries has been rapidly increasing for many years past; and the weight of meat annually supplied from a given area of land is now from 20 to 100 per cent. greater than it furnished thirty or forty years ago. It is chiefly by means of the so-called forcing system that the produce of meat has been so considerably increased. If this system was abandoned, the production would be greatly diminished, and the consequently high price of the article would place it beyond the reach of the masses of the population. Besides, it has not been proved that the flesh of the animals brought early to maturity is inferior, except somewhat in flavour, to the meat of three-year-old beasts. There is, no doubt, plenty of unwholesome meat offered for sale, but it is that of animals which were affected by diseases as likely to attack the young as the old. On the whole, then, we may say of the improved system of fattening stock, that it produces a maximum amount of meat on a given area of land; that the meat so produced is, except in rare cases, perfectly wholesome; that it is capable of supplying the ingredient—fat—which is almost wholly absent from a vegetable diet; and, finally, that it places animal food within the reach of the working classes.



*On the Status of Farriers : What it Is, and what it Should be.*

By Professor GAMGEE, Senr. An Address read before the Farriers of Edinburgh and Leith, on the Evening of 5th February.

MR CHAIRMAN AND GENTLEMEN,—Gratifying as it always must be to take part in social assemblies which have for their object the devising of measures tending to the public good, the pleasure is infinitely increased when, as on the present occasion, I am called on to address a meeting composed of the Farriers of Edinburgh and Leith, whose vocation, and the work and business of my own life, consist of one and the same kind. To meet and speak to an assembly of fellow-workers in a common cause, and that a right one too, is, in my own estimation, no ordinary privilege.

I feel the responsibility of the part I have assumed this evening the more, because I regard the incident as possible to be the inauguration of a new era in your social position. Meetings, at which free and fair discussions are carried on have constituted the most effective means for bringing about reforms, of advancing knowledge, and contributing to the wellbeing and happiness of classes, which, when blended together, make up the community. These social means of exchanging and multiplying knowledge are special to our common country, and form a feature in modern civilisation in most others. The greatest promoter of this kind of intercourse, which I should like to see established throughout our body, is, as you know, the world-renowned Lord Brougham.

Amongst the daily meetings of different bodies of the artisan classes, with a view of furthering various objects, which are announced in the newspaper columns, no account of a meeting of the working farriers ever occurs. Indeed I question whether any one ever thinks that there is such a body of men ; though they all know that there is some hard-worked, ill-paid individual who shoes their horse, bears all sorts of unjustifiable blame, often much abuse, but reaps no equivalent reward for his work.

I shall aim, in what follows, to make it known that the farriers of Great Britain do constitute a body of men, who have wives and children, for whom a suitable place should be assigned.

Since, however, we have never raised our voice, or in any way announced our existence as a body, we need not be abashed if the first obtrusion should meet with a less noticed reception than might be desired. I will tell you why we have been less importunate than the followers of other branches of industry ; and why we must not take too much credit to ourselves either for modesty or forbearance, as it will be found, on correctly scrutinising us, that we belong to the same stock as makes up the population of this nation—we inherit the mixture of greater and lesser good

parts—like the rest of our fellows. But the chief cause which has kept you silent, and made you submit to be called the ignorant, clumsy farrier or smith, has been the all-important nature of your calling on the one hand, and your hard-worked, impoverished condition on the other. You cannot be kept in large numbers at one place, like the manufacturers of Birmingham, Manchester, and Glasgow, but you must be found wherever there are horses, and that is over the whole surface of the land. In small numbers together, often only two or three, you are distributed throughout every town and village in the empire, and are called to serve in every cavalry regiment, battery, and military train in the Queen's service, so that you never have been assembled, like many other classes, in numbers sufficient to attract notice. In fact, the case of the farriers has been much the same as that prefigured by the old man in his address to his sons, to whom he presented a bundle of sticks, and requested them, one after the other to break the bundle asunder, and after each had tried it on his knee, and used his efforts to break the mass, the aged man said, Open it and break one stick at a time, which they did easily; when he rejoined, There, my boys, you see the moral: so long as you all remain united and true to yourselves, no power can assail you; but only divide, and you will be exposed to every adverse influence.

Once, however, the principle of co-operation becomes understood and acted on, the spreading wide over the nation of men of any given calling, does not prevent effective combination for good works affecting a body such as that of the farriers of Scotland, or of the whole kingdom.

The number of farriers spread over the kingdom, or to be found in any division of it, is unknown, even to the authorities on such questions—as necessarily must be the case, owing to the vague import of the term farrier; you, however, constitute a large class, and, as we shall presently show, one that should be better known and understood than it is. You have wives and children too, who, all other motives failing, make it imperative for you to assert your position in society as a class.

In the first place, What is generally understood by the word farrier? Our dictionaries tell us, one who shoes horses, or who professes to cure the diseases of horses,—the word farrier being derived from the metal used for making shoes. Farrier or smith is a term used amongst us to designate men of your craft, and has been applied, without much discrimination, to horse-shoers, and workers of iron for other purposes. As the smith's art is no doubt of much older date than that of the horse-shoer's, when it was found necessary to protect horses' feet by means of iron shoes, the worker of that metal was the man at once employed to shoe the horse; this much, however, seems to be admitted—viz., that the farrier's is a branch of the veterinary art; and, believing as I do



that it is inseparable from it, I shall proceed to reason on that ground.

I am not amongst those of my brother members who exclaim that their calling is lowered by its alliance with the business of the shoeing forge. On the contrary, when I entered the veterinary profession, I made the choice for the love of the calling, and from a deep impression I had of its importance, having, after making the choice, served an apprenticeship to the special branch of shoeing as the first step—and nothing has ever made me lightly estimate its importance; nor have I ceased, during forty years that I have been a veterinary surgeon, to study the foot in health and disease, or to seek to discover the best modes of shoeing; and what is more, whilst striving to prevent and remove the sufferings of horses, I have thought of the working farrier and his unsatisfactory state.

#### THE IMPORTANCE OF THE ART OF HORSE-SHOEING TO THE COMMUNITY.

I know of nothing so paradoxical, as that of the importance of the farrier's art, and the difficulty of acquiring it on the one hand, and the low esteem in which the artist and his calling is held, and the ill requital of farriers for their work, on the other.

You are called on from Monday morning to Saturday night to shoe the most valuable animal we possess, and which animal would be of scarcely any use in this country but for your labour. And although the work of horses, their number and value, have been for years constantly on the increase, no shadow of improvement has been extended to the farrier's condition. The truth is, that when a man is knocked down, nothing is easier than to keep him down,—and that is actually the farrier's case. Great mistakes have undeniably been committed by the public, in its own interest, in not looking better into this matter. When the much-needed Veterinary Schools were established in England, instead of improving the art and its followers, by blending new knowledge with the old, and improving the status of farriers, they became more than ever despised—the “clumsy, ignorant farrier” being usually about the best word you get; and if, in your very difficult vocation, you meet with an accident, abuse is heaped on you like coals of fire; but whilst horses go well, you get no praise, and only very bad pay, for work such as none but the well-skilled able-bodied man in the prime of life can do. Whenever I read of, or hear a man using language depreciatory of farriers as a class, I lose my respect for the author's discretion.

When our ancestors were charged with the responsibility of shoeing horses, and attending on them when lame and diseased, it was no fault of theirs in assuming it, there being no more fitly instructed set of men than those whose daily occupation it was to

handle their feet and legs in the operation of shoeing, and being called on also to treat accidents and diseases of the feet, the more intelligent obtained some little knowledge of surgery, and being always at their post—having in fact a shop, with the old recipes handed down from one generation to another in the family—they did their best to treat the horses. Now, in France, as civilisation advanced, and veterinary colleges were first established, they did with regard to the farriers what wise men might be expected to do; they simply improved the material they had—their farriers. The first regulation of that school said, that every candidate who sought admission to the college must give proof that he could make a horse shoe, and then, after four years, if he studied and worked well, he was allowed to practise as a veterinary surgeon. To give a notion of what the great man who founded veterinary schools in France thought of shoeing and shoers, I will quote a passage from his work:—

“The little progress which has been made in the knowledge of this department has served to keep it in a low condition, which has even influenced the other departments. People have been in the habit of considering the man who exercises this art as merely a machine occupied in striking iron; they have not looked further, and hence both the workman and the work have been equally depreciated, since it is one of the characters of the stupid vanity of the mass to despise the works of the hand, however useful they may be, to despise, in the person of the man who employs them for the good of society, the use of those instruments which nature has specially bestowed upon us to subserve to our wants and to aid us in our industry.”—*Bourgelat, Essay Theorique et Pratique sur la Ferrure*, p. 7.

To give an idea of what a great English authority also thought of the farrier and his calling, I will quote a passage from a work by the Earl of Pembroke, published in the latter half of the last century, at page 97. The noble cavalry officer said, “It happens, unfortunately for us, that the farriers belonging to the army, for want of proper education, due inspection, and encouragement, are void of all real skill and knowledge in their profession, and have minds, in short, quite uncultivated. I do not, however, despair of seeing in time some intelligent farriers properly instructed; and when such are found, and not till then, the number of them in regiments should be increased; it would even be much better to have none at all till such a reformation is brought about.”

Here, then, we see a noble-minded officer, of noble birth, relating that farriers were insufficiently instructed, and holding out hopes of seeing the necessary reform brought about: he wanted not only better educated farriers, but inspectors, which of course meant veterinary surgeons; for though we had none of these, the time was approaching to establish a veterinary school, which, as he knew well, had then already been done in France, the



founder of the French colleges was the Earl's intimate friend. Thus, you see that your calling has been appreciated by a few wise men, but wisdom has not predominated, and farriers and farriery suffer through a prevailing unjust depreciation of them and their calling.

No doubt the noble disciplinarian saw, as just noticed, the want of a specially educated and scientifically-trained class also; which, as far as the higher and the lower were concerned in the art of horse-shoeing, should stand in the same relation as the many workers and the few directors do amongst engineers, it is not a distinct kind of knowledge, but a question of degree, that should distinguish the highest from the lowest in our ranks. With no absolute line of separation, let mental training and manual skill, each in all degrees be fairly recognised, encouraged, and rewarded, and then we may expect to see the Earl of Pembroke's theories in a fair way of practical realisation.

When the time arrived for establishing a veterinary school in England, the carrying out of that undertaking differed so thoroughly to the whole scheme which had been pursued and found to answer well in France, that we need not be surprised to find, as we do, a corresponding difference in results; and since different seed produces different fruit, I will quote from the work of another French professor, one of the present time, and a man known by his works, who says:—

“The task which I have undertaken to accomplish is a difficult one, but if this work (his *Treatise on Shoeing*) does not fully answer my expectations, I shall still be conscious of having neglected nothing which lay in my power to obtain a successful result. Born and bred in a farrier's shop, I have from an early period been initiated in this difficult art. Having been intrusted now, for a period of ten years, with the duty of conducting the courses of farriery in the Veterinary School of Lyons, I need not fear the reproach of having wielded a profane pen, to write upon subjects new to me.”—*Professor Rey*, Lyons 1852.

In my early course of professional work,—and constant labour up to the present time,—I perceive a resemblance between Professor Rey's lot and my own; with the important exception that, in the latter stage, he falls into a beaten track, sanctioned by customs and the experience of a century, whilst I follow upon an accumulation of false crotchets, which has taken two or three generations of men to pile up; and the work of demolishing the widely-diffused, deeply-rooted errors on the art of horse-shoeing is such as require resources not readily estimated. The right men blended the art of farriery with the lights which new science shed; smatterers mistook true science for shadows, and in trying their 'prentice hands, they confused the old farriers, and took the reins out of their hands, till at length nothing intelligible and sound on the subject was left free.

Taking a momentary glance at the state of the art of farriery and those who followed it a century ago in any part of the United Kingdom, we can understand that neither were what could be looked on as satisfactory. But there is a wide difference between an infant state of knowledge and an erroneously-directed class. The ploughman, the shepherd, and the labouring mechanic, men who have read little else than their Bible, are capable of being raised to any state of intelligence and usefulness ; but take those classes in their youth and imbue them with notions directly opposed to what is right concerning the business of their lives, and you do injury to them and to the community of which they form a part, and such has occurred to the horse-shoer.

Formerly, master farriers took apprentices, and engaged to keep and instruct them in all the mysteries and details of their business. In that mutually convenient way, youths worked on with their first master up to the age of manhood, when the most persevering and able aimed in turn to fill foremost places as journeymen, and in due time of becoming masters.

When, however, the new state of things was inaugurated, and it was thought that every farrier's shop was to be replaced by that of a veterinary surgeon, who, be it remembered, was not called on to give any guarantee to the public that he possessed any applicable knowledge on the matter, the possibility of the farrier becoming a master then no longer existed. The farrier henceforward was doomed to keep his nose to the grindstone, at whatever small weekly wages any master pleased to give him for any amount of labour. The country smith and farrier stood his ground, but those in large towns all succumbed, or rather, as the old well-to-do masters died away, their places were filled by veterinary surgeons, who, to say the truth, have always been found the best and most humane ; but they were masters after all, and the men could aspire to nothing else beyond their low condition.

I have started a point on which I wish to dwell in this place. You know that it is the boasted pride of all members of the British Empire, to exclaim, that with real merit and good conduct any man may possibly rise from the lowest to the highest station of usefulness. In the case of the farrier, I tell you, that not only is the probability of advance distant, but out of the question. Instead of our new reformers of the horse-shoeing art setting about to elevate the men and their calling, they did what bad surgeons used to do with men's limbs—they lopped them off, whilst great surgeons persevere and heal them. Farriers can stand the fire well ; but they have been placed between two fires—hard work incessantly on one hand, and starvation on the other.

The masters, I believe unwittingly, have always compromised with horse-owners—those of the towns did the shoeing and the



doctoring, and those in the country did the shoeing and the smith-work, whether on the farm or the estate. The first sent in his bill somewhat in this form—For shoeing, . . . shillings; for seton, bleeding, blistering, and firing, &c., . . . guineas; and the latter—Making an ornamental garden gate, hanging bell, mending the poker, &c. In both cases the shoeing will be either done at a loss, or else at too little surplus over the cost of the work to admit of its paying shop rent; and if a farrier asks for more wages he is met with—"Oh dear, look at what we get for shoeing, and what we pay; I can't afford to give you more, and if it was not for the doctoring," says the one, "I could not keep you." And the jobbing master, who, by-the-bye, often does the best work himself, says to his poor young lad, "If it was not for getting the jobbing up at the house with the shoeing, I could not live by our work." And thus the thing goes on from bad to worse, until you, as a class, second to none for stamina and hard work, are placed in a condition which requires amendment. No master has a right to take the labourer's service for less than its worth, because he chooses to enter into some compromise with a third party for the price of the thing done.

Let us see what kind of service the farrier renders to the public, at what cost, and what return he receives. In the first place you are always to be at your post, from six o'clock in the morning until six in the evening; and on all emergencies of great stir, when others are amusing themselves, you are called on to work, whether it be a frosty Christmas eve, or other holiday-going time. If, for example, a gentleman's groom neglects to take his master's horse to the door in regular time, the inconvenience is great; if the family coachman forgets to have the carriage ready, all appointments are upset; if the drivers of commercial men's carts, or cabs and omnibuses, were all to play truant at one time, and if the letter-carriers were to join them, there would be a public consternation; but if you farriers were all to ask for justice to be done you, and insisting, as the baker does, for the price of your children's bread, and were to suspend action, as he would, until terms were agreed on, in the space of one short week fully one-fifth of the horses of the nation would be laid aside; and, if the time of disagreement extended to 15, 20, or 30 days, horse-labour would be lost, and the groom, coachman, carters, and postmen would be of little use. People don't think of a dearth until they feel it. Now, such a contingency as the above is by unthinking people rendered possible. All the railways in the kingdom would be brought into confusion by interruption to horse power for a day, and the Armstrong guns might fire salutes from the Castle and the Forth, but want of horses would stop the public wheel; there is no class of men in the land that could become your substitutes,—not all the forge-smiths, including the whole military service, could do your work.

What is the kind of knowledge that a farrier requires? In the first place, he must possess all the expertness at forging of iron that is required of men who make anchors, muskets, swords, &c., and then he wants a new and totally different kind of knowledge; he should, and always does, know something of the foot of the living horse, and ought to know much more than he has any opportunity to learn; all this is of infinitely greater difficulty, and the process necessarily slower, than to learn how to forge and file iron and steel to measurement.

What are the wages you receive? I shall not confine myself to the notice of Edinburgh, or even to Scotland alone. I have been manyfold more years acquainted with London and the south than with the northern division of the kingdom; and, beginning with the metropolis, I may say that farrier's wages are mostly confined between the limits of 28s. and 40s. per week. Foremen of the highest class as workmen receive two guineas, but of these the number is small, and such a sum is almost entirely confined to London; in the north, including Edinburgh, I shall not be much in the wrong if I quote the amount at from 16s. the lowest and 26s. as the higher range.

Now for a sketch of the work done. I will suppose three men going in to make five dozen of carriage-horse shoes for their day's work. As the clock strikes six the bellows move, and side after side is blown out, until nine o'clock, when 20 to 24 shoes are made, and the men stop half-an-hour, sit down to a slender breakfast of tea or coffee and bread and butter, then into the mill again they go till dinner-time, and afterwards finish the day's work. Now, since perhaps these observations may fall before the eyes of some who keep horses, I may just remark that when a trainer is preparing a race-horse,—as he says, is giving him strong work,—he divides the horse's exercise in walking, and gentle gallops, with occasional faster bursts, and at given periods a good sweat. Farriers are not so systematically put to their work, but are kept full stretch at it; every one of the dozens of shoes forged requires about 150 strokes, or 9000 to the five dozen, with the sledge hammer, in the act of forging, fullering, and stamping, whilst the fireman, constantly plying his hand hammer with one hand, turns and holds the shoe in his tongs with the other; moreover, the bellows are constantly to be kept full and blowing. There is this difference between the ordeal of the farrier and the work of the horse in training, that the first is constantly at it, all the year round, the only change being that of the mode of working, now at making shoes, and then fitting and applying them, whilst the horse is relieved at proper intervals.

There is one thing, above others, which Englishmen and Scotchmen are ashamed of, and that is, of flinching from work; therefore in the hard task, which custom more than necessity has made horse-shoeing to be, the strongest men pull on, like a staunch



Clydesdale horse, with a heavy load when rising a hill, by increasing speed to get rid of the burden quickly.

Having shown the incalculable value of the farrier's art, and also that he is over-worked and inadequately paid, I will next notice some of the effects which follow such abuse of good nature. In the first place, the man, ground down by weight of work and indignities, cannot, at the same time, develope the free activity of mind in his work which, as a rational independent agent he should do. A vigorous, sound body is necessary to a full activity of mind; and an exhausted man under bodily fatigue, with no compensating returns to cheer him, cannot confer all the benefit in his sphere which, under better circumstances, he would do.

How often I have felt for a man going from his work, steaming with perspiration, which has been indured for many hours, knowing too, that instead of a house of ample size and convenience, where he could wash his body and change his linen, that he is the worst housed amongst the poor classes; with a wife and children in a garret the poor farrier sits down in his wet clothes to his scanty fare, or what I know to be a common consequence of this state of things in London is, the man goes from his work to warm and dry his body by the side of some tap-room fire, and there takes his beer, and sits, because his own home is comfortless. I have now said enough on the hardships of the farrier's case, and may add, that I have come to the conviction that justice will not be done to the horse until farriers are put on a more intelligible and better footing.

I believe that when a youth has made choice of an art, he should be properly instructed in it, and made to feel that there was no impassable bounds to his advance; to make such promises, however, there should be altogether a more equitable scale of pay for his work. The charge for shoeing horses would have to be increased accordingly, and the work being in due time brought to be done by a rational method, the great gainers would be the horse-owning public.

I know that it is not an easy matter to bring about the required changes, and I also know that things cannot go on long as they have been progressing, or rather retrogressing, relative to this art. The conditions of all other classes is improving, by the rule, probably, that all those who help themselves become helped in return.

It is well to know that the condition of the farrier may be made better, and cannot be worse than it is. This is a consoling view to take. Human affairs are managed, under Providence, by the wisdom of the learned: Chance, however, has a large margin to her share, and a good deal goes by fashion; those in easy circumstances, who trouble little about the smaller details which make up the sum total of human happiness, change fashions

often, whilst such a thing as the grinding down of a whole class of indispensable artisans to the lowest grade of civilised existence, goes on unchanged, unheeded, little known. I remember reading of a circumstance some years ago in the *Times* newspaper, which happened near London, as worthy of notice, and as illustrative of these expositions. It was this:—A nobleman was sporting on a public race course, and by some chance was said to have committed an assault on a gentleman who was riding on the same ground. The latter brought an action for redress, and, when on trial, the plaintiff being described as a veterinary surgeon, this question was put to him. “Mr —, you are a veterinary surgeon, are you not?” Answered, “I am.” “Pray, tell me, did you ever shoe a horse?” Answered, “No.” This *no* put the case and decision in the plaintiff’s favour. He was pronounced a gentleman, and L.100 damages was at once awarded. Here a tribunal gives a premium to the man for declaring that he never did that which his assumed calling pre-supposes should be his daily business with the public.

*Note.*—The author of the foregoing address is desirous that a right interpretation of his views on the relative position of veterinary surgeons and farriers should be given. Whilst deploring the unjust treatment of the latter, and their helplessness as a body, to improve their social condition, or raise their art to its required efficiency, he is convinced that the whole veterinary professional body suffers thereby.

The question at issue does not turn on the proposition, often taken up, as to whether or no the veterinary profession is to be recruited to a greater extent from the body of working farriers, but whether both the one and the other are to understand and be able to render that kind and amount of public service which is wanted.

Fully sensible of the many outlying fields yet requiring the veterinarian’s labours, the writer would still urge, as by precept and example he has tried to show, that it is good policy to recruit our strength from all available sources; and not to encourage the continuance of the custom of doing the short course, by running in one narrow rut.

Let our professional body seek to acquire robust strength, intellectual, physical, and moral; let its members be gentlemen,—and not least, let them be workers. It has always appeared that the true gentleman is a worker, in whatsoever sphere his lot be cast, and that it is his counterfeit alone who considers it beneath his position to work out any part of his calling in all its required details.



*Case of Lameness, associated with discreditable proceedings on the part of persons concerned in the Sale of a Horse.* By Professor GAMGEE, Sen., New Veterinary College.

THE subject of the following notice was submitted by a very respectable cab-proprietor to Mr Gamgee, sen., at the New Veterinary College, on the 27th of January.

The history of the case had been related to Mr G., on whom the owner of the horse called the previous evening, when he stated that he had purchased the horse three days before from one of the extensive dealers in horses in this city; he was recommended by the seller as fit for a match horse to go on a job, for which purpose he was wanted. The purchaser made objections at the time to the horse's feet, when the dealer replied that he had a corn, but that his veterinary surgeon, who understood all about it, would shoe the horse so that the corn would give no further trouble; on these conditions the horse was purchased for £20. A moderate price for so good looking an animal, if sound.

The horse was put on the job the day after purchase, and worked the first day fairly, but on the second day was very lame; and it was in the evening, at the end of this last day's work, that our advice was sought, and on the following morning, according to appointment, the horse was brought to us.

On his being submitted to examination, the following particulars were noticed:—Brown gelding, 9 or 10 years old, 16 hands high, well-formed, handsome in style, and adapted for a chariot or brougham horse, was found, on moving, to be lame on both fore feet, which was observable even whilst standing still; he was suffering most with the near foot, and both legs were swollen as high up as the knees, the ligaments and tendons were rigid, and the limbs were kept in a comparative straight posture; there was also a large splint close under the knee of the off leg, which had been recently fired.

Having already heard the history of the case, and seeing that the purchaser was hurt at what he pronounced to be a "take in," it was thought advisable that he should leave the horse at the infirmary, and in the mean time to take no steps tending to add to existing vexation, but rather to look for a good result. The advice given was adopted, the poor man adding, "If you can help me by getting the horse better, I will then get rid of him as best I can." The horse being left for treatment, he was at once made the subject of an instructive lesson to our college class, and the shoes were taken off all four feet. Both fore feet had been excessively denuded of hoof in all parts, most particularly of the soles, which were pared so thin as to be incapable of sustaining their part in the economy of the feet. Besides the paring and

rasping generally, at the inner angle of the near foot, a kind of shaft had been sunk with the drawing-knife, with a view, it is presumed, to extirpate what was called a corn, or to do some other cruel thing with the poor animal's bruised heel.

Very little was done by ourselves to the horse, beyond placing him in a comfortable loose box, leaving his feet in the meantime clean and dry, after they had been duly washed and ointed.

The special attention of the students had been invited to the state of the feet, and at the same time the engorged rigid state of the legs, as on frequent occasions these phenomena are seen together, being related as first and secondary effects due to common causes. It was prognosticated that as soon as the cause was removed—*i.e.* the shoes—and the feet placed more favourably, that the effects would begin to subside, and that as the pain left the feet, and the circulation found its equilibrium, the round and hard condition of the tendons under the knee would disappear, and the legs would assume their normal flat and free appearance.

On the third day from the entry of the horse, I proceeded to re-examine the feet, in order to ascertain precisely the seat and extent of all the injury, and when I came to the off fore foot, a discovery was made, which I will relate. That foot was the one which had been least mutilated, and it was the one least examined on the first day, because the horse could not support his weight on the near whilst the opposite one was lifted; therefore examination was deferred, till, as the pain subsided, I proceeded to do to the off foot on the second occasion that which had been done to the near on the first, *viz.*, to examine fully, and level down some sharp parts of the scarce hoof with the file. There was found, on applying the file at the outer heel, a small round stone, which had been cunningly fixed into the concavity between the inflected wall, commonly understood by being called the seat of corn. The stone was clearly placed in its fixed position on the recent occasion of the horse being shod; the shoe had been placed over the stone and nailed on, so that when in action there would be such a degree of pain produced as would, in a measure, equalize the state of lameness in the two feet, by which the acute pain in one foot—the near—would become less manifest. Cases of *beaning*, the slang word used by the perpetrators of the London Smithfield school, we had heard much about, but had never before met with a single one; it used to be talked of as a cruel and fraudulent practice carried on by the lowest of the low at the Smithfield Horse Market, but we had lived under the simple delusion that the practice had been a thing of the past.

The stone which we discovered was very nearly of a spherical shape, and measured exactly half-an-inch in its longest diameter, 3 lines in its shortest. It weighed exactly 27·66 grs., and its specific gravity was 2·7462. This little stone is in itself a curiosity to be preserved.



Meanwhile the horse was fast improving, and the owner was advised to put up with his purchase quietly, and told that there was reason to believe that the animal would do the work for which he had been bought, or else realize by sale the cost price. The impression, however, which disappointment and sharp practice had made on the owner of the horse was not easily removed, and he showed a preference to get rid of what had been stamped on his mind with the character of a bad bargain.

Several circumstances made the case more than ordinarily interesting to us, and rendered it instructive to the observing students. We therefore ventured to violate a very sound rule, prescribed to us in early life by one of the first and most experienced veterinary surgeons of the time in England, viz., "That veterinary surgeons had better never recommend a friend to purchase a horse; that if they did, they would be almost sure to lose both their time and their friend."

A gentleman, a friend of ours, and of veterinary science also, was wanting a brougham horse, and we had no hesitation in strongly recommending our lame patient to him, and did so. And in order to obtain a trial of the horse, the animal's recovery being far advanced, on Wednesday the 3d February, a week from the day the horse entered, we took pains to shoe him; and having succeeded in the task of fitting shoes to the mutilated feet, with insufficient hoof to bear their burden or defend the nervous sensibility of the foot's surface; when done, the horse moved perfectly free from lameness, and on being turned loose in the riding-school, he exhibited good action. The price to be given for the horse having been previously agreed on for the new sale, the gentleman offering to take him for the twenty pounds, as recently paid by the cab-master to the dealer, and further to defray all charges made by ourselves for keep and treatment, a trial was offered, and on Thursday, the 4th instant, the horse was put to a brougham, driven about the streets of Edinburgh, went most satisfactorily, and the deal was effected.

It was left at our option to keep the horse at rest, for some time longer if necessary; that, however, was not required, and nothing further was done; and the horse has been serving the family constantly from that day.

It is now the 19th of February, viz., three weeks and two days since the horse first came under our care. He is in full work, perfectly sound, and is a good horse. Taking his age and all into account, he would be a bargain to a London job-master at L.45.

CONCLUSION.—There are three aspects especially, under which this case may be made instructive,—*Firstly*, As to the treatment pursued, and the result.

*Secondly*, This case is worthy of record, for the evidence it

brings to light, showing that the Smithfield horse-coper's practice of old is not entirely a bygone custom.

And *lastly*, The phase of the case to which we attach much importance is, in its showing how litigation may be avoided by prompt and proper measures being taken. It rarely happens that a month passes during which we do not succeed in a similar way to stop or end disputes. It is very generally assumed, on false grounds, that sellers of horses know all about their stock, in health and disease, such is far from the truth; and here the old adage is good, that in trying to prove a man a rogue, it will often happen that he is only a fool after all.

Nothing is easier than to keep a horse lame for want of knowing the cause and character of the injury, and how to treat it; whilst incompetent busy men stir up a whole neighbourhood by their rash proceedings, it is some recompense to ourselves to know that our course of action and success has been fully recognised and approved by members of the legal profession of the highest standing. I find that they abhor a disreputable horse cause as much as it is possible for men of great minds to detest bad actions. In the case above described, the biters were bitten, and they have received a most salutary warning lesson, which will be far more effective than the verdict of a jury; since much exposure hardens some men, but turn the weapon inwards, and the miscreant pauses.

---

### *The British Pharmacopœia.*

“OF the several functions conferred on the General Medical Council of the United Kingdom by the Medical Act of 1858, not one has caused the Council more anxiety than the preparation of the British Pharmacopœia. To supersede three pharmacopœias, each of them long held in great repute; to reconcile the varying usages, in pharmacy and prescription, of the people of three countries, hitherto in these respects separate and independent; to consult the prepossessions of three important public professional bodies, which have ruled long and ably over this branch of medicine; to represent accurately, yet with caution, the advancement made in chemistry and pharmacy during the thirteen years which have elapsed since the last edition of any of the pharmacopœias of the College of Physicians was published, has been no light task.” These are the opening sentences of the important work which has just issued from the press, under the auspices of the General Medical Council.

Since medicine became systematically and extensively cultivated, physicians have in all countries felt the want of authorised works, in which the remedies used in their profession are de-



scribed, and the mode of preparing and compounding them indicated. Most of our readers are aware of the existence of the three Colleges of Physicians of London, Edinburgh, and Dublin. These Colleges possessed the right granted to them by Royal Charter to publish the Pharmacopœias, which were the only legal guides for the preparation and dispensing of medicines in the division of the kingdom to which the authority of each college extended. The London College of Physicians was the first to establish a Pharmacopœia; and we find that it issued the first copy in the year 1618; since that time eighteen different editions and reprints of the same book have appeared. It was only in 1699 that a similar work was issued by the Edinburgh College, whilst the first edition of the Dublin Pharmacopœia was delayed until 1807; the Irish College having up to that time made use of the work published by the London College. We have no time to follow out the progress displayed in the successive editions of the several Pharmacopœias. Such a study would show us that, in proportion as medicine is becoming more perfect, its armamentarium is becoming less wieldy; its remedies, if more powerful, are undoubtedly less complex than they used to be.

At a time when England, Ireland, and Scotland remained to a certain extent independent countries, separate Pharmacopœia might be upheld as useful. National prejudices would at any rate insist upon their maintenance, and innumerable obstacles would have attended any attempts to amalgamate the works of the three Colleges. Since the days of railways and steam navigation, with the more perfect fusion of the three divisions of the kingdom, these difficulties have in great measure faded away; and at the same time the great disadvantage of having no one legal standard for the preparation of medicines has made itself more and more felt. The three Pharmacopœias were not merely different in name. The drugs authorised by them were, it is true, nearly the same, but the greatest diversity existed in the mode of preparing them, and in the strength of the preparations, whilst there was even a want of uniformity in the weights and measures authorised by the different bodies. The Medical Act of 1858 provided, that there should henceforward be one Pharmacopœia, instead of the three which had preceded it, and it confided its preparation to the General Medical Council.

The objects which the writers of the "British Pharmacopœia" had to hold in view were mainly the following:—To expunge all useless articles from the "Pharmacopœia;" to decide between the rival claims of different formulæ for the same substance, and to give the preference to the best, and to add those remedies which the experience of late years has shown to be useful to the physician. The question of weights and measures had to be settled, and an attempt to be made to introduce the imperial weights into pharmacy. How far the objects in view

have been attained, we shall be able more readily to discuss after furnishing some details on each.

Let us see what steps the Medical Council took to further the object committed to their charge. In the first place, they appointed a Pharmacopœia Committee, to which was entrusted the task of preparing the work. This committee was composed of members of the General Council, and in great part of gentlemen not members of the Council, who, having distinguished themselves in pharmacology, therapeutics, or chemistry, could give their valuable aid in the arduous undertaking. The majority of the members were chosen from the ranks of the medical profession, although the Pharmaceutical Society furnished not a few. The committee was divided into three sections, which had for their centre, London, Edinburgh, and Dublin, respectively. Each of these sections had a local secretary; each committee undertook certain subjects, and an active correspondence was carried on between the several committees. Meetings were from time to time held of members of all the committees, when the more important matters which could not be settled by correspondence were discussed. Professor Christison was, we may add, the president of the Pharmacopœia Committee. The different sections began their meetings in 1858.

The "British Pharmacopœia" is a work of 444 pages. It is written entirely in English, the names of the drugs and their compounds being, for the convenience of prescribers, also given in Latin. It consists of three parts, or more correctly of two parts and an appendix. The first part consists of the *Materia Medica*; the second of the preparations and compounds; and the Appendix describes those substances which, although not directly used in the practice of medicine, are required in the operations of the pharmaceutical laboratory.

In the *Materia Medica* is found a description of all the medicinal substances "which are so far approved in practice as to be entitled to a place in a national Pharmacopœia." Besides the definition and description of the substance, the Latin and English name, the chemical symbol, or the botanical name and source, are given, with a reference to a correct figure of the plant, and a statement of the quarter whence the article is obtained. The tests for ascertaining the purity and strength of the substance are also indicated, and the names of the preparations into which it enters, given.

As an example of the system followed, we extract from the "*Materia Medica*" the article "*Antimonium Tartaratum*."

*Antimonium Tartaratum.*

*Tartarated Antimony.*

*Synonym*—*Antimonii Potassio-Tartras*, Lond.

Tartrate of Antimony and Potash,  $\text{SbO}_3$ ,  $\text{KO}$ ,  $\text{C}_8 \text{H}_4 \text{O}_{10} + 2\text{HO}$ .

*Characters*.—In colourless transparent crystals exhibiting tri-



angular facets, soluble in water and less so in proof spirit. It decrepitates and blackens upon the application of heat. Its solution in water gives with hydrochloric acid a white precipitate, which is not formed if tartaric acid be previously added.

*Tests.*—Twenty grains dissolve without residue in a fluid ounce of distilled water at 60°, and the solution gives with sulphuretted hydrogen an orange precipitate, which, when washed and dried at 212°, weighs 9·91 grains.

*Preparations.*—Unguentum, Vinum.

In the second part of the book the preparations and compounds are given in alphabetical order.

### *The Weights and Measures of the British Pharmacopœia.*

It has long been a matter of regret that the imperial standards of weight should not be used in pharmacy. The Colleges of Physicians of London and Edinburgh gave the sanction of their authority to the Troy weights, according to which the pound was divided into twelve ounces, the ounce into eight drachms, the drachm into three scruples, and the scruple into twenty grains.

The Medical Council has abandoned all the Troy weights, with the exception of the grain, and has adopted the imperial pound and ounce.

The drachm and scruple henceforward cease to exist. The pharmaceutical symbol for the ounce (℥) is also abandoned, the two letters *oz* being used instead.

The measures for fluid are the same as those hitherto in use, which were arranged by the Colleges of Physicians in accordance with the imperial standard. Instead, however, of using the symbols  $\text{f}\overline{\text{℥}}$ ,  $\text{f}\overline{\text{℥}}$ , and  $\text{℥}$ , to signify the fluid ounce, drachm, and scruple, we are now directed to write *fl. oz.*, *fl. dr.*, and *min.*

Below we give in a tabulated form the weights and measures as authorised by the British Pharmacopœia:—

#### WEIGHTS.

1 pound = lb	= 16 ounces	= 7000 grs.
1 ounce = oz.		= 437·5 grs.
1 grain = gr.		= 1 gr.

#### MEASURES.

1 gallon	= C	= 8 pints	= O viij.
1 pint	= O	= 20 fluid ounces	= fl. oz. xx.
1 fluid ounce	= fl. oz.	= 8 fluid drachms	= fl. drs. viij.
1 fluid drachm	= fl. dr.	= 60 minims	= Min. Lx
1 minim	= min.	= 1 minim	= Min. j.

All who consider the alterations which have been effected in the weights and measures will admit, that although their employment in the first place may be inconvenient, it was nevertheless wise to remove the glaring inconsistency of having two sets of weights in use in the country.

We are amongst the number of those who regret that the

Medical Council did not attempt the introduction of a decimal system of weights and measures. Fully admitting the very great difficulties which would have attended such an introduction, we believe that it would have been well had the medical profession, at all hazards, shown their adherence to principles which have received the sanction of all scientific men, and which in a few years we shall undoubtedly see carried out, in a British decimal system of weights and measures.

(*To be continued.*)

---

*Cancer of the Tongue in an Ox.*

SURGEON'S HALL, FETTERCAIRN, KINCARDINESHIRE,  
28th January 1864.

SIR,—I have sent you, per rail, a box containing the tongue of an ox five years old. As it is a rare case, I was anxious to get your opinion of the nature of the disease. It appears to be carcinoma, and yet I cannot, by microscopic examination, detect any distinct cancer cells. Besides the parts sent, there was a very large tumour of the same nature as the rest, extending from the inferior surface of the atlas, enclosing the trachea and gullet—in fact forming a ring, a segment of which you will find *in situ*.

I may say, in one word, the other organs of the animal were in a perfectly healthy condition. I was careful to ascertain this, as I expected to find morbid lesions in some of the glandular organs, especially in or on the mesenteric glands; but such was not the case, and the disease (whatever it is) was quite local, so far as I could ascertain.

You can at once conceive the symptoms that would indicate this affection—the animal's head hanging down; copious flow of saliva; the tumours easily felt externally; and the condition of the tongue seen on looking into the beast's mouth.

I may say the skin had become very dirty, the hair coming off in patches, and for some time there had been an abundant crop of lice; the tongue was very much larger when taken out than at present, from serous effusion.

The history of the animal is as follows:—

The stot was bought at one of the markets in this neighbourhood in January 1863, along with a lot more store beasts, and put into a comfortable court with the rest. Very shortly thereafter I was called to look at him, as he would not feed. I found him standing just as if he had got a potato or some other obstruction in his throat. On examination I found a hard tumour about the size of a goose's egg, situated between the branches of the sub-maxillary bone. I concluded that this was the cause of difficult breathing; and with a view to hasten the



maturation of the tumour, I rubbed in a pretty smart blister, ordered the animal to be taken from the court and fastened up in a byre; also directed the owner to feed liberally, with a view to get him off as soon as possible; he got oil-cake, &c.; after this he appeared to do well. I never heard any more about him until a few days ago (25th January 1864), when being at another case at the same place, I was requested to look at the stot. I was told he had done ordinarily well since I blistered him till about a month ago, when he began to lose flesh rapidly, and refuse his food. As soon as I saw the tongue, and the evident great distress it was giving the animal, I ordered him to be destroyed. There was one interesting fact I discovered after he was killed; he was bought for an eighteen months' beast, and appeared to be about that age at the time; but in truth he must have been rising four years, as he had a full mouth when killed.

This shows that the disease was not of recent origin in him; for, had he thriven during his first year, he would have been as large as he was at five. In fact, he was about the strength and size of a very good year old. I cannot think this is a case of gloss-anthrax, because there was never any great constitutional disturbance; it seemed to be more a mechanical impediment than a constitutional disease; and moreover, gloss-anthrax runs its course for good or ill in a very short time. I also think it is more than a case of simple glossitis.

You will do me and others a great favour if you could give some hints on the pathology and morbid anatomy of the subject sent,—what might be the cause of it, &c.?—I am, &c.

ANDREW SIMPSON, M.R.C.V.S.

*Remarks.*—The tongue sent has hard nodular eminences numerous scattered over its dorsal surface, but especially on its borders and lower aspect. These vary in size from that of a pea to that of a hazel nut, and seem to extend deeply into the structure of the organ. The whole muscular structure is seen to be interspersed with tumours of a similar kind.

Their cut surface has a grayish hue, and on scraping, yields an abundant whitish fluid strongly resembling cancer juice. In this fluid, we detected cells with several large nuclei and nucleoli, evidently cancerous. Although most of the masses situated externally had an indurated feeling like scirrhus, many of those within the organ were more soft and compressible. One of the largest, indeed, located at the root of the tongue, between the two genio-hyo-glossi muscles, had in part, assumed a semiliquid appearance, not at all resembling pus, however, but having more of a gelatinous consistency.

# EDINBURGH VETERINARY REVIEW

AND

## Annals of Comparative Pathology.

---

### LEGISLATION FOR THE PREVENTION OF DISEASE.

A PROLONGED agitation of the all-important question of cattle-plague prevention has led to the desired effect of calling not only public attention to the subject, but of inducing Government to provide measures to facilitate the extinction of malignant disorders whenever or wherever they may appear. Even before the enactment of new laws to regulate the importation of animals, and the general traffic in diseased or infected stock, it is apparent that we have not laboured in vain, as appointments have been made in various county towns, securing the services of veterinarians to inspect markets and fairs for the separation of sick from healthy stock. This desirable movement must acquire shortly great importance, and the veterinary profession must bestir itself to obtain for itself that which is fair and equitable, not grudging assistance for a time, even though it has to be rendered for a small pecuniary return. It is impossible to avoid noticing, that veterinarians have been overlooked, to the serious detriment of the public interest, and to the no less damage of the professional men themselves. Tailors, weavers, butchers, policemen, coachmen, butlers, and men of all trades, have been selected for duties which have been regarded of minor importance, and calling for little judgment or special knowledge in their performance. As a correspondent writes, it would seem that the persons appointed to inspect slaughter-houses, knackers' yards, cattle markets, &c., have been procured, with a little influence, amongst vestrymen or other municipal authorities. They have been appointed to positions regarded almost as sinecures for worn-out men who have failed in other and not very exalted callings. How could such men further the cause of sanitary reform, and suggest means to control the spread of contagious diseases? How could they trace out the parasitic diseases which have recently acquired such importance in relation to the subject of meat inspection? How could they recognise the first signs of insidious disorders, which should in themselves warrant the exclusion of stock from crowded fairs or markets?



The feeling is daily growing stronger, that qualified veterinary inspectors must take the place of the unqualified men who have signally failed in discharging the duties for the performance of which they were employed. Veterinarians themselves may have some difficulty in mastering the details of what we consider a proper system of veterinary inspection ; but a good will for the task, and a little time, are the only requisites to secure success. We are anxious that, though perhaps scantily paid for at first, the importance of the work of a veterinary inspector should be demonstrated by the zealous and enlightened discharge of duties which are acquiring importance in the eyes of the people ; and in the course of time the positions which are now opening up will acquire the value they merit. Medical men, lawyers, clergymen, in fact the members of every profession, have with time developed positions of honour and profit to themselves, as of great usefulness to the community at large. This is what veterinary surgeons needed ; and much was done by Professor Coleman, when he laid the foundation for army appointments, which have materially improved, and have increased in number of late years. If, as in Germany or France, civil appointments are made over the country, our profession will rise in public estimation, and must acquire influence and wealth. In Britain, veterinary surgeons have not linked together, and as scattered elements they have been weak. A powerful union is likely to be effected when, as in other professions, common interests affect the whole, and they can co-operate under an efficient organisation. We do not look forward to an early solution of all difficulties, and to a combined movement, before the lapse of more time than many of us are inclined to wait for, but we can only progress by degrees, and it must be our great aim to avoid retrogression. If we advance one step, let us push on for the next, and to do this we must unselfishly and zealously work for the common good. We shall be glad to report the appointment of veterinarians as they occur to positions as inspectors in different parts of the country. A record of these appointments will stir up some spirit of emulation in the less enterprising cities and districts, and in due time we can learn how far we have advanced in the organisation of a system of sanitary reform based on utilising efficient veterinary inspectors.

## THE BREEDING OF HORSES.

EACH successive monthly and weekly issue from the press, of periodicals and journals which are devoted to agricultural subjects and the rural sports, afford fresh evidence that the subject of breeding of horses has stirred men to action throughout England and Ireland.

That the vastness and importance of the subject is such, that practical good can only be expected to result by the combination of wisdom formed from the free contributions of many councillors, has long been our belief; acting on which, we have from time to time borrowed expositions of the views of others, the tendency of which seemed likely to widen the foundation on which some system of action might possibly be devised.

Discussions, however, to be useful, should be conducted under the regulation of some rules. The subject of horse-breeding is one which, more than almost any other, affords unlimited scope for speculation, theorising, and for mere display of words, exponents neither of facts nor theory to sustain any argument, with tendencies to a convergence of ideas such as may be expected to lead to practical good in the end.

We have been led to throw out the above remarks, through reading an article—which is going the round, quoted from a London periodical—entitled, “The Sires of the Day; reminiscences of Sweetmeat, Kingston, Touchstone, and Orlando.”

The first of the above-named four renowned sires is the only one about which we have any remarks to make.

“North Countryman,” in his description of Sweetmeat, says,—“In walking, his hind foot went into the print of his fore foot; and so good a horse, and so true in his action, was Sweetmeat, that there is no doubt this peculiarity may be generally observed in good staying horses. It has been held, that it is a good sign if a horse walks with his hind feet well over his fore ones; but, on the contrary, the best horses never walk over with their hind feet,—if they do they don’t stay.”

The assumed facts, with the whole argument in the above quotation, is not merely a tissue of nonsense, but is highly erroneous, and its tendency, when read by non-critical readers, will be to extend and confirm error.



Sweetmeat was one of the excellent horses which, throughout his career, whilst in training and as a stallion, we admired, but never saw. Then, it may be asked, what is our description of the horse worth, who confessedly never saw him, when opposed to the matter-of-fact account given by one who tells of what he believes he did see? Why, because men see things very differently; and that which "North Countryman" believes he saw, and by which he tries to show the prevalence of a law, we simply state to be a thorough delusion, and that so perfect a horse as Sweetmeat, could not, in his ordinary and natural state, have exhibited such action as is attributed to him in his walk.

Nothing seems easier than to misrepresent the form and character of a horse after he is dead, and it might seem equally difficult to establish counterproof where no opportunity could be afforded of seeing the animal; and such would be the case but for the undeviating laws of nature, an understanding of which enables us to show what horses that are dead could do, and what they could not do, by demonstrating what living horses can perform and what they are unable by their nature to accomplish.

We therefore assert that no living son or daughter of Sweetmeat can show such a phenomenon in the walk, as that of implanting the hind foot into the print which the raised fore foot leaves; to establish the truth of this proposition, it is not necessary to limit our observations to a few of the high class sons of Sweetmeat now in training; any of the free and sound horses in and out of training, including the brood mares, if they be made to walk a single mile straight in free style, will answer the purpose, since that horse's stock exhibit the good qualities of their sire to a remarkable extent.

Going back to Sweetmeat himself, and to his primitive condition, leaving his blind and otherwise infirm state out of the question, as unreliable for any exact data, we affirm that when that horse was in his extended walk, which would probably cover the distance of four and a half miles in the hour, that his hind feet would overpass the print which each parallel fore foot left, by about 15 inches.

The above phenomenon can be observed, so as to prove the law, which could not have been violated in a horse so perfect as Sweetmeat himself was.

"North Countryman" has made some selection, from Dumas

“On the Arabs of the Sahara,” which seem also unhappily chosen, if instruction be his aim; the quotation runs thus:—“A horse is considered strong if he clears fifteen or sixteen feet in length in his first bound. If he covers a greater space, he is deemed to be of superior strength; but if he clears no more than ten feet, he is set down as a heavy animal.”

It is scarcely in keeping with such effusions as the above, struck off when men get out of their depth, that the author of the article “The Sires of the Day,” should have let us escape the infliction of having Eclipse brought forward again, and adducing his case as an instance in point to prove that such horses go as “North Countryman” has laid down the law.

In concluding our remarks on the above, we submit that it is not encouraging, to adherents to rigid modes of prosecuting inquiries, to see that a writer is at liberty to draw a bill at sight for such hypothetical stuff, touching great questions, involving vital and physical functions from which animal action results, which are susceptible of exact treatment. Is it that the writer’s aim is only to supply his readers with such an amount of common sense as he imagines they can bear? If so, no enviable compliment is paid them.

With all due respect for the authorship of the foregoing, we beg to state that no horse, Arab or English, can stride sixteen, or even fifteen feet in his first motion, in his start into the gallop; and secondly, that when the stride is formed, and the horse is in action at full speed, there is no Arab or English blood-horse, in his sound active state, whose stride is so limited as only to give ten feet in length of measurement; and we will go further and say, that the heaviest bred English or Scottish cart colt, when turned loose into a field, to use a nautical phrase, when the machine has got under weigh, that will not show a stride in his gallop much over ten feet, as will also a pony of ten hands high, with a boy of six stone weight on his back.

Sweetmeat’s early career as a stallion had a strong resemblance to that of Priam; each of the two horses produced two winners of the Oaks soon after they went to the stud, whilst neither of them gave a Derby or St Leger winner; to these incidents, however, no importance is to be attached,—they belong merely to the laws of chance and the chapter of accidents.

In the comparison it appears to us, that Sweetmeat came off as the best stallion of the two, because his winning produce



came from a smaller number and a less choice selection of mares, unlike the great son of Emilius, and Derby Winner, the sire of Mincemeat and Mincepie, had no Derby or St Leger victory to enlist popular favour. Horses of the character of Sweetmeat, and such as Asteroid, and Carabineer, have to repeat their great feats several times under heavy weights and over long distances, before they reach the height of renown conferred on the Derby horse of his year. But we believe that, notwithstanding the few good mares put to him, Sweetmeat did produce a Derby colt in his second season. The Block—brown horse Honeywood—was justly entitled to much of the notice he obtained as a Derby colt in 1853, and it is our belief, that had there been as much knowledge on the subject displayed in the management of Honeywood's feet as there was in that of his training and jockeyship, that he would have changed places with at least two of the horses that ran in before him at Epsom, even if he had not deprived West Australian of the honour of taking first place, exceptionally good as the Derby and St Leger winner of that year acknowledgedly was. But the fact of the one horse being very good does not change the other fact, that Honeywood was also good; but his feet were not in condition to be fairly acted on by his great powers, and to stand the work throughout his preparation and over the Derby course.

We, after his racing career was over, made selection of Honeywood, as a stallion to go to Naples, before the season, when he was five years old, and proof was afterward afforded, that had the horse remained in England, he would have been no mean representative of his sire, as a getter of race-horses; Mr John Osborne put two of his mares to Honeywood in 1854, and was rewarded for his sound judgment by obtaining two colts, both of which became winners—See Honey Stick, and Honey Tree. The first named colt, we believe, died early, after giving good promise of making a good horse, by winning as a two-year old. The second, after winning, when three years old, the Queen's Plate at Lincoln, a cup at Beverley, the Staffordshire stakes at Lichfield, and two Queen's Plates in Ireland, was sold to run somewhere abroad.

We have named these incidents, because it is our belief that in that early son of Sweetmeat and the Waverley mare, the sire, which only late received the credit due to him, would, but for a series of accidental circumstances, have been credited by a son of his early produce, very much after his own form.

## PERISCOPE.

—o—

THE PAST AND PRESENT OF THE IRISH TURF, AND ITS  
EFFECTS ON BREEDING.

By "BEACON" (late of "BELL'S LIFE.")

"Pars sanitatis velle sanari fuit."

"To yield to remedies is half the cure."

*(Continued from the February Number.)*

THUS it will be seen how much we owe to these horses for the present prosperity of the English Turf; for from them or their sires are descended Chanticleer, whose great grand sire was Buffer; Stockwell, whose great great grand sire was Escape; and King Tom, whose great great sires on both sides were Nabocklish and Sir Walter; and I may here notice the close affinity that exists between King Tom and Chanticleer, Buffer and Rugantino being own brothers. And the horses in the above list, unlike the majority of those bred now-a-days, could all get a distance, which should, however, cause no surprise, considering the care taken in their breeding. Pope, winner of the Derby in 1809, found his way into Ireland in 1812, being bought for the late Marquis of Sligo by the present Lord Lonsdale (then Lord Lowther), who, in his letter announcing that he had purchased him for 1000 gs., wrote that he sent him the best bred horse in the world save one, and that was Swordman—a great compliment to Irish breeding to be passed by so good a judge. In buying Pope, who, on coming to Ireland, took the name of his sire, Waxy, in conjunction with his own, in order to distinguish him from Pope by Shuttle, Lord Sligo made a great hit, for not only was he the winner of many races, but he subsequently became a sire of no mean celebrity, though, like Bob Booty, he only began to get well after his twentieth year, when he was the sire of Cant, Canteen, Steel, Starch, Skylark, Kiss (grandam of Chanticleer), The Distingue, The Dandy, Glance, Steam, &c. And the purchase of Wire proved equally fortunate for Col. Bruen, who, being desirous to win the Gold Cup at the Curragh, requested the late Mr George Watts, of Jockey Hall, to buy him a horse able to do so, when that gentleman proceeded to England, and made choice of Don Cossack by Haphazard, and Wire by Waxy, both of whom he went to see at Newmarket, when he made up his mind to purchase the latter. This resolution was, however, much more easily taken than executed; for on reaching Euston Hall, the seat of the Duke of Grafton, Lord Henry Fitzroy, his brother, and the owner of the mare, at once refused the offer of 2000 gs. for her, alleging that his father advised him "never to part with any of the brown coloured produce of the famous Penelope;" when Mr Watts, greatly chagrined at the failure of the negotiations, took his departure. He had, however, hardly proceeded half-a-dozen miles from the Hall, when a messenger overtook him, bearing a letter from his Lordship, stating that he had changed his mind, and would accept his offer; and thus, in her fourth year, was secured for Ireland one of the celebrities of the day, who, being foaled in the year of the great comet (1811), her winning the Oaks of 1814 was generally anticipated, and which she only lost for want of a pace. In the spring of 1816, when five years old, she made her *début* at the Curragh in the Gold Cup, four miles, a race of the value of 2200 gs., which, with 5 and 6 to 4 on her, she won easily, beating Friday, Petuaria, Sir Roger, and another; but on the Saturday of the same meeting Mr Denis Bowes Daly's Bravo beat her over the course for a match of 1000 gs. each, even weights. She subsequently, however, before the close of the season, recovered her lost laurels, as she beat Bravo in a match for 400 gs. a side from the Red Post (one mile and three-quarters), and again for the Lord Lieutenant's Plate, over the course; her net winnings during the year amounted to 4075 gs. In 1817, Wire again carried off the Gold Cup, beating her old antagonist Bravo; but in the



following year it fell to Bob Gore, the best son of Bob Booty, and who, besides Cregane in later years, was the only three-year-old that ever had the honour of winning this famous prize. But as much might be expected from a horse who as a two-year-old won the six engagements for which he started, quite off hand, amounting to 1770 gs., no inconsiderable sum in those days. In the following April and September, Bob Gore repeated his success ; but in 1821 he was forced to succumb to Bob Roy, another son of Bob Booty. The Peel Challenge Cup, one mile three quarters, run on the severest course of the Curragh, was established in 1819, in honour of the lamented statesman, Sir Robert Peel, then Chief Secretary for Ireland ; and, though now obsolete, gave rise to many a gallant contest, in which Langar, Welcome, and Skylark distinguished themselves, the latter winning it four times in succession. In 1821, George IV. paid his memorable visit to the far-famed plain of Kildare, and in commemoration thereof he presented the Royal Whip to the Turf Club, with 100 gs., to be run for annually over the course, welter weights. And this race has, since the Gold Cup became obsolete, been one of the principal tests of merit at the Curragh. Nor did it fall on its being first contended for, which was in the presence of the Royal donor, into ignoble hands, as Lord Sligo won it with the celebrated Langar, to whom it also fell in the year but one following. But the great gun of that day, over the course, was Roller (by Quiz, winner of the St Leger, in 1801), who carried off the Whip three times, a feat which was likewise performed by Skylark in 1830 and the two succeeding years. The accustomed "Go along, Larry," of the owner of the latter to his jockey Keegan, will never be forgotten by those who even once heard Mr Disney give that mandate with stentorian lungs, as he galloped from the Rath to the flat to meet the running horses ; but it was of no avail, for the Whip race in 1833, the year I paid my first visit to the Curragh, for Napoleon, after being at the stud for two seasons, came out in his old form, and beat Skylark and four others easily.

In the following year I joined the Turf Club at Kildare, and how busy had been the hand of the fell destroyer within the preceding ten years was told by the thinned ranks of its members, which forcibly brought to mind the truth of the poet's inspiration :—

" Like leaves on trees the race of man is found,  
Now green in youth, now with'ring on the ground ;  
Each spring's return another race supplies,  
They fall successive, and successive rise."

Of the choice spirits whose names are recorded above, there only remained the Marquis of Sligo, Lord Portarlington, Lord Rossmore, Col. Armstrong, Mr Fitzmaurice Caldwell, Mr Battersby, Mr M. J. Blake, Mr Pottinger, Mr Hunter, and Mr G. Watts ; while the other members comprised the Marquis of Clanricarde, Lord Clanmorris, Lord Langford, Lord Howth, Lord Milltown, Hon. Col. Westenra, Hon. Capt. Vaughan, Col. Synge, Capt. Armit, Mr J. Maher, Mr Quin, Mr A. Montgomery, Mr G. Knox, Mr Disney, Mr A. Mansfield, Mr Walter Mansfield, Mr Parsons Persse, Mr St George, Mr O'Connor Henchy, Mr Digby, Mr H. De Montmorency, Mr Hynes, &c. The principal breeders and owners of horses, besides, were the three brothers Kelly, Mr Kennedy, Mr Hendrick, Mr Fitz-Patrick, Mr Flood, Mr Ferguson, all resident in the county of Kildare ; and, in the north, forming a little *coterie* of their own, were Mr Maxwell, Mr Fivey, the two brothers Robert and John Martin, Mr Bradshaw, and some others. That year was prolific in good three-year olds, as Frency, Shamrock, New Fashion, Rust, Mirza, Peacemaker, and Wellington, were all good horses, particularly the former, whom I have always regarded as the true model of the race-horse. The appointment of Lord Normanby to the Vice-royalty, in 1835, gave the Curragh a great lift, as he not only patronised the meetings by running horses, but rented a lodge in the vicinity of the Curragh, where he often entertained the members of the Turf Club with a profuse liberality. In 1836, the progeny of Sir Hercules being three years old, began to distinguish themselves, as the First Class of the Madrids fell to my own filly, Maria, besides



several other races ; and in the Second Class, Birdcatcher, who never ran as a two-year-old, owing to a severe attack of the distemper, in which his life was despaired of, made a successful *début*, his principal opponent being Maria, whom he beat easily. But the Peel Cup, in the following June, was his great race, though unhappily one that cut short his career on the Turf. In that race he beat Frency at least a quarter of a mile, and was so little exhausted that he broke away with his jockey, and taking the precipitous back road to Newbridge, he soon reached the turnpike at Moorfields when he stopped, having galloped himself to a standstill. His nervous temperament was ever afterwards affected when brought out to run, which occasioned his early retirement from the Turf, with what benefit to the stud the extraordinary successes of his stock have exemplified. 1837 was prolific in good three-year-olds, as among the number were the celebrated Harkaway, Cruiskeen, Mercury, Talleyrand, Windfall, Magpie, &c., the two former of whom had a distinguished career in England ; and the year but one after, came Roscius and Retriever. In 1840, Mayboy upheld the fame of Guiccioli, and divided with Vulcan the honours of the year ; and had Tearaway remained sound in 1841, I believe that he, and not Satirist, would have been heralded the winner of the St Leger that year. Faugh-a-Ballagh, Mickey Free, The Pride of Kildare, and Patriot, all the property of the late Mr E. I. Irwin, were the “cracks” of ’44, though the former confined his performances entirely to England. In 1845, The Baron carried off the First Class of the Madrids and the Kirwans, winning the latter, carrying a heavy impost, in such a style that his subsequently carrying off the St Leger and Cesarewitch ought not to have occasioned the surprise it did. The succeeding year was remarkable for bringing out Chanticleer, Burgundy, The Plover, Finvaragh, and several other famous three-year-olds ; only the two former distinguished themselves in England. The accession of the late Marquis of Waterford to the Irish Turf, which took place the same year, gave racing a great impetus, not only at the Curragh but all over the country, and his carrying off the Anglesey’s with Lady Margaret in 1849, was everywhere hailed with great satisfaction. And that year witnessed the success of Volcano for the First Class of the Madrids, which is worthy of notice, on account of his being the sire of Pauline, the dam of Fille de l’Air ; for I find by reference to the French “Stud Book,” that I was in error when, in my survey of the two-year-old performances, I stated she was by The Stoker. I then gave Ireland the credit for fostering the blood of Count Lagrange’s splendid filly, tracing her pedigree through the horse I then presumed to be her sire back to Bob Booty. But her pedigree is now proved to be still more Irish, as Volcano was bred by the late Capt. Gamble, in the county Westmeath, and is by Vulcan out of Mansfield Lass, by Filho da Puta out of Variety by Selim, to whom she undoubtedly throws back. The Turf in the next year received another addition to its ranks in Mr J. Courtenay, who, after his success with Matthew for the “Grand National” at Liverpool, in 1847, formed a small stud, though he never failed to express his preference for cross-country sports. At the outset, he had the good fortune to pick up Lælia, by Sheet Anchor out of Cotillon, by Partisan out of Quadrille by Selim, an admirable combination of stout and speedy blood, which though it failed to show to any great extent in her immediate offspring, shines forth in her grand son and daughter, Union Jack and Caroline, with undimmed lustre. And about the same time Mr R. H. Copperthwaite formed a stud at Crotenstown, bordering on the Curragh, which, had he only persevered with, would unquestionably have requited him handsomely for his outlay and trouble. Better blood there was not in the United Kingdom, as among his mares were Ariadne by Birdcatcher, Colleen Dhas by Rust, Calcavella (dam of Lady Kingston) by Birdcatcher, The Deformed by Burgundy, Dawn of Day (dam of Twilight and Sunrise) by Tearaway, Devotion (dam of the Druid and Mount Zion) by Harkaway, Discretion by Economist, Light of the Harem by Magpie, Mag on the Wing (dam of Blarney) by Magpie, Magnet (dam of Early Bird) by Skylark, and Thorn (dam of Sprig of Shillelagh) by Plenipo, all of whom would most probably have “lit” to the horse he made choice of, Mountain Deer, and for whom he paid a much larger sum than he



got for him when he unfortunately came to the resolution of breaking up his establishment.

Further I need not pursue the history of the Irish Turf, which is now narrowed into a very small compass, for few, very few of the supporters of the national pastime named above are now living ; and in these later times the deaths of the Marquis of Waterford, Lord de Freyne, Mr Watts, Mr Willington, Mr E. J. Irwin, Mr Garrett Barry, Mr T. Kennedy, Mr P. Colgan, have left a void that cannot be easily filled up. Example has, however, a powerful effect, and as the noblemen and gentlemen forming the Royal Agricultural Society of Ireland have warmly taken up the subject of horse-breeding, and as they admit its being carried out successfully is dependent on having good thorough-bred horses, they may be induced, like the Marquis of Conyngham, the Marquis of Drogheda, the Marquis of Downshire, Lord Howth, and other good men and true, to personally aid in restoring the Turf to the state of prosperity it enjoyed in the first quarter of the present century.

BEACON.

### A CASE ILLUSTRATING THE DANGERS OF SLAUGHTERING DISEASED CATTLE.

By JOHN GAMGEE, Esq., Professor of Veterinary Medicine and Surgery, New Veterinary College, Edinburgh.

(From the *Lancet* of 13th February 1864.)

ON the 22d of October 1863, a bull was taken ill on a farm and in a county which I decline to name. My reasons for not mentioning the place are, that every effort has been made to keep the secret, as in a host of similar cases, and it will serve no purpose whatever to expose those who, in ignorance and in consequence of the lax state of our laws on this subject, acted as their neighbours would have done. A labourer on the farm, who had been formerly a butcher, volunteered to slaughter the sick bull, that its carcase might be saved for the butcher's stall. Unfortunately, the poor man had previously injured his hand with a spade, and he performed his task without due regard to the condition of his wound. It is said that the bull was dying from pleuro-pneumonia, but others declare the disease was of too rapid a type to be the very prevalent lung complaint. Certain it is that four pigs died after eating part of the viscera of the bull, and two dogs nearly lost their lives in the same way.

The bull was disposed of to a butcher for the sum of L.5 ; and after this, not only was it seen that the pigs and dogs had been injured by eating the flesh, but the labourer suffered intense pain in his hand, was seized with severe febrile symptoms, and died on the fourth day after dressing the bull.

I am favoured by a surgeon with the following report of the case :—

“ I saw the man for the first time on the second day before his death. I then found a ragged wound, about an inch long, nearly dividing the tendon of the back of the second finger of the right hand. The edges of the wound, for about three-eighths of an inch all round, were very much swollen and dark-coloured ; in fact, the wound looked like an opening made with a blunt instrument. The swelling was well defined ; there was also severe cellular inflammation of the arm to the elbow, with the usual boggy feel all over, from the back of the hand upward. Fever and the usual symptoms of severe cellular inflammation prevailed. Notwithstanding tonics and stimulants, the man sank rapidly (the fever having turned to typhoid), and died on the second morning after I saw him. He was much addicted to habits of intemperance.”

Many of the readers of “*The Lancet*” may suppose that this is a solitary case, or, at all events, a rare one. The usual question may be asked, Why should I, as a surgeon of so many years' experience, not have heard of or seen such cases ? To my own knowledge, four other men have died, presenting



symptoms such as the above, under similar circumstances and in the same county, during the last four years. Another man, a butcher, nearly lost his life; and the surgeon who attended him asked him what he had done with the diseased cattle he had dressed. This question was asked, as the surgeon feared that the carcasses were at that time being cut up in the town where they had been slaughtered; but he was somewhat consoled by the usual reply, "They've been sent to London."

During the past year the attention of a number of gentlemen has been directed to cases of serious illness and death in various parts of the country. A landed proprietor wrote me concerning an instance in East Lothian. An animal was slaughtered, packed in a basket, and sent either to Edinburgh or London. After the carcase had been dispatched, the pigs were taken ill, and several died; they had eaten of the animal's entrails. The man who dressed the bullock nearly lost his life, and only recovered after nearly losing his eyesight. Some liquid from the thorax was splashed against this man's face, and he suffered severely from inflammation of the face and trunk. His eyes were most seriously affected, and vision has only been restored in one.

In the Edinburgh slaughter-houses similar accidents have been witnessed, though every effort is made to conceal the truth; and one case, which occurred in 1863, was identical with the one that occurred in East Lothian. During the outbreak of malignant anthrax in Lincolnshire last autumn, a shepherd scratched his arm whilst dressing a sheep, and he very nearly lost his life.

It is now about fourteen years since I first began to agitate the question of cattle disease in relation to the public health. During that time I have reported outbreaks of anthrax and of splenic apoplexy, and have repeatedly drawn attention to the deaths amongst pigs, dogs, ferrets, &c., from eating the viscera of diseased cattle slaughtered. I have striven, as best I could, to specify the forms of disease communicable to man, and which render the flesh of such animals unwholesome; and my opinion, based on a very careful consideration of the whole subject, is, that the public health is materially affected by the wholesale slaughter of diseased animals as human food. Several years ago I declared that it was impossible that human beings were not frequently injured by the eating of the flesh of cattle that had died of splenic apoplexy in this country; and the reason why cases have not been published is, that the carcasses have been sent to large cities, *where they would not be distinguished from the carcasses of perfectly healthy animals*, and the evil results of eating the poisonous flesh could not be distinguished from any ordinary case of dysentery or typhus. The best proof of defective observation on these subjects is afforded us by the trichinous disease, of which not a single fatal case has been recorded in this country, but many abroad. That the disease is often amongst us is certain, and the infant that died in Paisley last year, as the result of eating "measly (?) pork," undoubtedly, in my mind, succumbed to trichinous infection.

Knowledge gathers slowly, and medical men must proceed with prudence in drawing inferences from cases observed; but I hold that they have hesitated too much and too long in raising their voices against the filthy and demoralising practice of slaughtering diseased animals as human food. With a proper organisation, I will engage to reduce the mortality in the London dairies from forty and fifty per cent. per annum to four and five. This would at once prevent the sale of several thousand diseased cows as human food in the metropolis alone. Would not such work be better worth paying for than inspection of markets? and is it not worthy of the strongest recommendation on the ground of economy, if not on that of saving human life? We "strain at a gnat and swallow a camel" when we condemn the French for their vivisections, and allow our population to be cut down in thousands by painful and preventible diseases. On no ground can we defend the slaughter of diseased cattle, and medical officers of health need not wish to be fortified by evidence of cases of death in man from eating diseased meat in order to interfere vigorously with the traffic in diseased animals. That traffic is the most potent cause of disease in animals themselves,



and unless checked, our stock-owners will suffer even more in the future than they have in the past. We cannot keep pace with the demand for meat, and prices are ruling higher every year. To secure an adequate supply of wholesome animal food we must devote ourselves to the prevention of disease amongst animals, and no greater blunder was ever committed than that of declaring that our poor must starve if we condemn all the diseased animals sent to the butcher. The poor may console themselves a little by the reflection that it is the finest cattle in the best condition that usually die of splenic apoplexy, and the accidents which befall the pigs and ferrets from this cause are more likely to be witnessed in the homes of the wealthy than in those of people who cannot afford to pay the highest market price for beef.

## THE OPERATION OF DIPPING SHEEP.

*(From the Scottish Farmer, February 13, 1864)*

As with all important business duties, the process of dipping sheep is one which imperatively demands the flockmaster's personal attention. We have had frequent opportunities of observing that the same dipping compound used under precisely similar circumstances has had a very different effect on two different flocks. There are many matters to be attended to, and it is not to be wondered at that the neglect of some apparently trivial precaution should lead to failure when least expected. In carrying out the details of the operation, the duties of the farmer are of the most responsible kind, as he has to look after everything and everybody. He has to see that the bathing apparatus is in good order, that the men are in sufficient number and properly organised for their work, that the dip is properly dissolved and of the requisite strength, that the sheep are kept long enough in the bath, and that they are properly drained. Information on these and other topics has been too scantily supplied, and young farmers in their inexperience suffer serious losses by deterioration and deaths amongst their flocks. We shall consider, successively, the various points which it is necessary that the stockowner and his servants should not overlook.

### 1. DIPPING APPARATUS.

Of late years great improvements have been effected in the construction of dipping ponds or troughs for sheep. They are of two kinds—fixed or moveable. If there is a convenient corner not far from the farmyard where a boiler can be had to supply hot water in abundance, and a spring or stream to furnish cold, it is desirable to fix an apparatus which is at all times ready for the shepherd's use. There are many such dipping troughs in various parts of Scotland; and we think the farmers who have them should adopt a plan, carried out to a limited extent, of charging a small sum to neighbouring farmers for the use of the bath. This sum should be applied to keeping the bath in good repair—a matter too often overlooked. A bathing machine accessible to all and sundry is sure to be injured, and it is remarkable how careless men are when they use an apparatus for a day, and think they have done their work for the season.

All dipping machines should be constructed with due attention to the following particulars:—

*a.* The trough should be narrow and deep, so as economise the liquid used. It should be narrower at the bottom than at the top, and should not hold more than 80 or 100 gallons of water, if to be used for flocks of sheep not exceeding thirty or forty score in number. Much larger baths are constructed for Highland flocks and in the colonies. A moveable apparatus is sufficiently large, if it is capable of containing fifty or sixty gallons of liquid.

One end of the trough should be slanting, so as to facilitate the lifting of the sheep on to the drainer. With a fixed bath, the slanting end is so constructed

with cross strips of wood as to enable the sheep to walk on to the drainer so soon as it is turned on to its legs by the shepherd, who lifts the head whilst his assistants leave the hind limbs free and lift the forequarters.

In the construction of a trough, care should be exercised to secure a ready outlet for the water, and to enable the trough to be washed thoroughly. The trough should at all times be kept with water in it, so that it may be perfectly tight when required, and it is handy to have it constructed so as to take up little time in emptying and washing it.

*b.* The drainer in a moveable apparatus consists of a wooden or iron grating fixed above a board with sides, so that the liquid which passes through the drainer on to the board finds its way directly into the bath again.

In a fixed apparatus, the drainer consists of an elevated boarding, square in shape, surrounded by a railing and separated into two halves by a rail. To each half there is a gate of entrance and one of exit, and between forty and fifty sheep should be able to stand on the drainer at once. The one-half is filled and the entrance-gate closed; then the other half is filled, and when its gate is shut the other half is open to allow the sheep to move off as they have drained sufficiently, and sufficient liquid has passed from their bodies back into the bath. In this way all the animals are sufficiently drained.

In the Highlands the best baths and drainers are built and paved with stone, and the draining-sheds are advantageous so as to secure protection from rain.

*c.* A sliding board is essential with moveable dipping-machines, so as to prevent the animals being injured when lifted off the drainer.

*d.* A stool or tub turned upside down is used by the side of the shepherd to turn each sheep on in readiness to be seized by the men dipping. This saves much time, and prevents the sheep being turned round hurriedly and roughly.

## 2. SECURING SUFFICIENT MEN FOR THE OPERATION.

It is essential to have a sufficient number of men when a large flock has to be dipped. As a rule, there should not be less than six with a moveable apparatus and four with a fixed one. One man catches the sheep; the shepherd then seizes the animal by the head, and two assistants take hold of it by the limbs on either side, and turn it into the bath. The animal is then lifted on the drainer, where other two assistants keep it still till another sheep has to be lifted on it. The men engaged at the drainer with a moveable apparatus are not required with a fixed machine.

Catching the sheep is of course a simple process when the animals are enclosed with a few hurdles near the bathing place. It is convenient to have two enclosures—a small one at the trough, shut in with four ordinary hurdles, so as to keep two or three sheep at a time that they may be quickly caught; and a larger one capable of holding a few score of sheep, which communicates with the lesser one.

It is the farmer's duty to see that all the men do their work, and to time them.

## 3. SELECTING A PROPER SEASON AND WEATHER.

Hoggs are dipped after being taken off turnips in the spring; ewes, with their lambs, in summer. The entire flock, in many districts, is dipped in October, when oily dips are used to protect the fleeces and the sheep. More or less animals are dipped at all seasons, and it is rare that, in the districts where the practice of dipping is becoming more common, the sheep are not dipped at least twice in the year. Dry weather must be selected for the operation, and it is best when warm. Frosty weather is by no means objectionable, but the sheep must be sheltered at night-time until dry. It is said that hot weather is dangerous when poisonous dips are used. This may perhaps be explained by the rapid evaporation of the water, and the fixing of a large amount of the poisonous compounds in the fleece, so that they are more readily carried in dangerous doses on to the grass. As we do not advise poisonous dips to be used, it



is immaterial at what degree the thermometer stands when a flock is dipped. If the operation is performed on a sultry day, and a frost sets in before the animals are dry, we find that the sudden change of weather and severe chill induces stiffness of the limbs, and sometimes acute rheumatism. All this can be avoided by proper shelter.

#### 4. THE CONDITION OF THE STOCK MUST BE ATTENDED TO.

It is best to dip when the flock is in good condition and in perfect health. Ewes should not be dipped when in lamb, except if affected with scab. When poisonous preparations are used, the ewes cannot be dipped until the lambs are weaned. Fat stock fit for market should not as a rule be dipped. Many of the compounds which pass from the fleece on to the grass and are taken into the system give the flesh an unpleasant odour.

#### 5. THE COMFORT OF THE STOCK MUST BE ATTENDED TO BEFORE AND AFTER DIPPING.

An essential point is not to hurry the animals and heat them. They should be kept cool and quiet. They should be dry, and however fine a day it may be, it is not suitable for dipping should it succeed a rainy night, and the fleeces therefore wet. After dipping, the animals must be protected from rain, and should not be inclosed on a small plot of ground, but should have ample space to roam about in.

#### 6. THE STRENGTH AND TEMPERATURE OF THE BATH MUST BE NOTICED.

Dipping compounds are sold in packets, canisters or casks, in quantities sufficient to do a certain number of sheep. The farmer should, however, estimate for loss; and though it may add a trifle to the expense, it is better to begin with a bath of extra strength than with a weak one. Twenty or thirty gallons of liquid must be either wasted or stored up for other purposes—such as killing lice on cattle, &c.—so that when a few sheep have to be dressed, either to kill ticks or cure scab, it is most economical to pour them. When several score, or a large flock have to be treated, the loss with the dip is not worth mentioning. The whole operation of dipping may be lost if the dip be made too weak, so that, having chosen a safe and useful compound, the farmer must not grudge its use in sufficient quantities.

We have observed that all parasites are killed most rapidly by poisonous solutions when these are warm. This applies especially to greasy compounds. The grease should not be allowed to get cold, as it fixes the active principle; and we have seen that sheep are benefited more by baths at 90° than at 60° Fahrenheit. The proper temperature is between 80° and 95° Fahrenheit. Some shepherds fancy that the sheep will catch cold after a warm bath. This is all a fancy, and we have usually seen that the animals have been most comfortable when the bath has been rather warm. The difference of the action of the hot and cold baths is very remarkable; and we have seen mixtures which would kill an acarus in thirty seconds when at 90°, only kill them in ten or twelve minutes when between 45° and 50°.

Farmers will glean from these remarks, that it is indispensable to provide boilers whereby large quantities of water can be heated during the dipping process. If the bath is at a distance from the boiler-house, it is expedient to have a water-cart, and thus to keep up a regular supply of warm water. In using the new sheep protecting or Melossoon dip, there is the advantage of not having to boil the mixture, and it dissolves very readily in tepid water.

7. *Timing the Men at their Work.*—When we consider that the dipping of a flock of sheep, if properly performed, need not be repeated for several months, we need not wish to hurry the operation, and, as a rule, no sheep should be in a bath less than a minute. We must place ourselves in the position of the sheep, and think how could we benefit much by staying in a warm bath a few seconds, or at most a minute. It is obvious that, when the work is well done,

not more than fifty sheep should be dipped in the hour. Six men should not dip more than 500 sheep a-day, and we look upon that as excellent work. We know that farmers will call out and say, that when they begin they want the job over, and if their flock number a couple of thousands strong, the whole must be dipped in a day; but for all that it is not right. A farmer cannot hurry the dipping beyond certain limits, any more than he can the operation of ploughing. When work has to be done, the great essential is to do that work conscientiously and well, and no excuses can be listened to when there is a disposition to sloven over an essential operation. It must be admitted that one of the most important matters on a sheep farm is to dip the sheep successfully, and if so, why grudge a day for the sake of getting over what is considered to be rather a tiresome job. When sheep are dipped for scab, they should be held in the bath two or three minutes, so as to give the parasites a very small chance of escaping from a poisonous dose; and it is well to repeat the bath with scabby sheep, after an interval of four or five days, in order to be certain of success. The experience of Australian flockmasters is, that the best preparations they can use—such as strong tobacco liquor—are apt to fail in the treatment of scab, unless their application is repeated three times at intervals of, not exceeding, a week.

### THE TRICHINA PANIC IN GERMANY.

(From *The Week*, February 1864.)

WHEN Mr Hilton, many years since, discovered, in human muscle, the small encapsulated body which Professor Owen afterwards showed to contain a microscopic worm, named by him *Trichina spiralis*, little did either *savant* anticipate the important part this apparently mere scientific curiosity was destined to play. At the present day, the frequency with which it has been found in the muscles and intestines of the pig, and the fatal and serious results which have attended the consumption of flesh so contaminated, has spread a true panic throughout Germany. Pig-eaters in every form, *par excellence*, the Germans have now foresworn this description of food, and herds of swine wander about marketless, to the ruin of their owners. Great exaggeration, we do not doubt, prevails in the accounts which have reached this country as to the number of deaths that have been produced; but enough is certain to render the case a very alarming one, as Professor Virchow admits, who has just published a popular account of the *Trichina*, in order to allay popular alarm by representing the truth as it really exists. A committee has also been appointed by the Berlin Medical Society, consisting of Virchow, Remak, Gurlt, and others, to examine into and report upon the whole subject. We fear that neither Virchow's pamphlet, nor anything else that has been written, will tend much to allay alarm; for all fail in pointing out the cause of the affection, or why it should have become so prevalent at the present time, and more especially in Saxony. The mode of feeding the pigs is pretty much the same now that it has always been; and although cases of sausage-poisoning have long been familiarly known in Germany, the present prevalence is something quite new. Virchow, indeed, seems to think that the swine flesh must have always been, more or less, infected with *Trichinæ*, and that its frequent communication to man at the present time is much to be attributed to the rapid and imperfect smoking which the hams and sausages undergo at the present day, compared with former times. Thus far, the disease has not been met with in any animal that is a vegetable feeder; and Dr Langenbeck says that *trichinæ* have been found in extraordinary numbers last year in earth-worms (as many as 500 or 600 having been seen in a worm of middling size), which form part of the food of the animals which swine feed upon when left at liberty. He advises the swine to be always fed in styes, and debarred access to localities where worms are numerous. It is not reassuring to find that there is no symptom indicative of *trichiniasis* in the pig, which, to all ap-



pearance, may be a highly healthy animal, the microscope being, indeed, the only means of detecting the presence of the worm. Effectual cooking seems the only means of assuring against ill consequences; and when poisoning does occur from *Trichinæ*, beyond the mere use of emetics or purgatives in the earliest stages, there is at present no remedy known, a natural cure of the disease taking place, however, in many cases, by the encapsulation of the *Trichinæ* in the muscles. Seeing that a large importation of German hams and sausages takes place into this country, it behoves our sanitarians to turn their attention to this matter, as one also practically concerning ourselves. Moreover, what assurance have we that our own swine are free from the disease?

## TOBACCO JUICE, LIQUOR, AND PAPER.

(From the *Scottish Farmer*, February 10, 1864.)

WE have recently devoted much space to the subject of sheep dressings, as our attention has been specially called to it and its difficulties, and these, as well as the general ignorance concerning it, have been strongly impressed on our minds. Farmers have gradually got to know much about the constituents of manures, and have learned how to obtain value for their money. They certainly have not done this with regard to preparations for sheep, which cost them hundreds of thousands annually. Of butter alone, not less than fifty thousand pounds' worth per annum is used in Scotland; and what if we tell the farmer that one-third of that is salt and water, which is positively bad for his wool and sheep, and without which the butter would be worth to him twice as much as it is at present. To-day we shall not deal with butter, tar, arsenic, or other products, concerning which we may have more to say hereafter. We intend in this article to afford farmers some information concerning tobacco compounds, and can go little further at present than introducing the subject. We hope soon to publish a series of analyses, and to draw attention to the means whereby the strength of preparations of tobacco can be calculated.

Tobacco preparations have as yet been recognised as the best for the destruction of the scab insect. Professor Gerlach accords them the first position for this purpose, and farmers in this country seem to agree on this point. There are differences of opinion, however, owing to a considerable number of very decided failures in the treatment of scab with tobacco-liquor. We have known as much as six gallons of tobacco-liquor used at one dressing for 150 sheep, and without effect, though properly mixed with other ingredients in a bath. The reason was obvious when we had the liquor analysed, and found only one grain of nicotine—the active principle of tobacco—in ten ounces of water. This was the whole strength of the liquor, and the price paid for it—only one shilling per gallon—was far higher than it was worth.

The preparations of tobacco, or the forms of refuse obtained in the manufacture of this material, are many, and vary with the process of manufacture as with the nature of the leaf. The chemical composition of tobacco is very complex, and it is evident that the proportions of elements may vary in different specimens, and some of them may be removed by certain processes and others not. Vauquelin discovered the active principle of tobacco—nicotine—in its impure condition. Posselt and Reimann were the first to obtain this alkaloid in a state of perfect purity. Vauquelin found, however, that in addition to nicotine and water, tobacco contained albumen, extractive matters, pigment, acetic acid, chlorophylle, malic acid, oxalic acid, phosphate of lime, nitrate and chloride of potassium, sal ammoniac, oxide of iron, and silicic acid.

Posselt's and Reimann's analyses gave the following results as to the constitution of tobacco:—

Nicotine, . . . . .	0·060
Nicotianin, . . . . .	0·010
Bitter extractive, . . . . .	2·870

Malate of Lime and Gum, . . . . .	1·740
Chlorophylle, . . . . .	0·267
Albumen and Gluten, . . . . .	1·308
Malic Acid, . . . . .	0·510
Lignin and a trace of Starch, . . . . .	4·969
Salts (Nitrate, Sulphate, Malate of Potash, Phospho- Malate of Lime, Malate of Ammonia, and Chloride of Potassium), . . . . .	0·734
Silica, . . . . .	0·088
Water, . . . . .	88·280

For smoking purposes, according to Casaseca, tobacco is best when containing most water and least ash. The quantity of water contained in ordinary tobacco varies between 14 and 25, and the ash constitutes between 16 and 19·4 per cent. The more ash tobacco yields the more ammonia it contains, and the less is the value of the leaf.

Schlösing has published researches on the relative amount of nicotine in different kinds of tobacco, and found as follows :—

French.		American.	
Lot, . . . . .	7·96	From Virginia, . . . . .	6·87
Lot of Garonne, . . . . .	7·34	„ Kentucky, . . . . .	2·09
Nord, . . . . .	6·58	„ Maryland, . . . . .	2·29
Ile de Vilaine, . . . . .	6·29	„ Havannah, . . . . .	2·
Pas de Calais, . . . . .	4·94	and even less.	
Alsacian, . . . . .	3·21		

Tobacco contains a principle called nicotianin, or camphor of tobacco—a concrete volatile oil which exists in sparing quantity, and is poisonous. It is a violent irritant ; and when brought near the nose, causes violent sneezing.

Nicotine is the active poisonous alkaloid of tobacco. It is one of the most rapid and deadly poisons known, causing trembling, fluttering of the heart, convulsions, clonic spasms, tetanic attacks, attended with great pain, and ending in death. During the convulsions the heart-beats are so rapid as to prevent their being counted, the pupils are largely dilated, and breathing is very laboured. Nicotine kills by its action on the nervous system.

It is the quantity of nicotine which regulates the strength of preparations of tobacco for sheep dressings ; and we hope shortly to lay before our readers the results of researches conducted with a view to ascertain a ready means of determining the strength—hence commercial value—of different products sold to farmers. Meanwhile, we may make a few remarks on these agents.

Tobacco juice is expressed from the richest tobacco in making roll tobacco or twist, whether Irish or Scotch. Comparatively little tobacco juice is obtained from the English manufactories, where cut tobaccos for the English trade are principally preferred. In making Irish twist little juice is expressed, but more in making Scotch.

The leaf is imported into this country as dry as possible, at a price of about eighteenpence per pound. On each pound the manufacturer has to pay a duty of 3s. 6d.

The dried leaves are placed on a drainer and wetted. The water which precolates the leaves in damping them, carries off a little nicotine, but this is allowed to flow away into the drain. The leaves are then opened out and rolled, with the aid of a little oil of the best kinds of olive, rape, or colza. Rolled thus into long ropes, the tobacco is made into round bundles, which are covered with paper and tied firmly by carefully coiled ropes. These bundles are placed between the plates of hand and hydraulic presses, so that pressure is gradually exerted on them and increased until the whole is packed as tightly as possible. The tobacco-juice flows, and is collected at the bottom of the press. It is thick, gluey, or tenacious, and of the colour of treacle, of a most bitter



taste, and slightly nauseating odour. Of this tobacco-juice or essence as the manufacturer calls it, little more than twenty pounds can be obtained from a ton of tobacco—that is to say, not much more than 1 per cent. ; and it may well be imagined that this material is extremely strong and fearfully poisonous. It is not sold in this condition, but is mixed up with tobacco-paper and tobacco-liquor.

The ropes which surround the bundles of twist are highly charged with the juice ; but they are always laid aside for further use, and only steeped to extract the juice from them when too dirty or old to be available for tying purposes.

The paper around the roll contains a considerable quantity of juice, and it is this article that florists use for hothouses to destroy insects. The paper is burned in the glasshouse, and the tobacco-smoke kills the parasites. The smoke, which is so deadly to insects, contains butyric acid, carbonic acid, ammonia, paraffin, water, carbonic oxide, carburetted hydrogen, a peculiar empyreumatic oil, and burning resin. Melsens has also found nicotine in tobacco-smoke. The tobacco-paper for gardeners' purposes is sold dry, and is much weaker than any preparation used for sheep.

The juice which is squeezed from the bundles of tobacco is collected and mixed with refuse paper, water, and salt. The salt is indispensable to preserve it, as the vegetable matters contained in the juice speedily decompose when wetted, and the foetor which occurs during decomposition is intolerable. The amount of water added is sufficient to dissolve the salt, and render the paper pulpy. Thus, a sort of megma is formed, which is preferred in the trade to other preparations, owing to the readiness with which it is packed for carriage. The paper, salt, and water are extraneous materials, for which farmers should not be called to pay the price they do ; and the profit on the tobacco paper arises from the greater part of it being composed of these extraneous products, which realise a handsome return at 1s. per lb. This tobacco paper has to be boiled for use with soap and other ingredients, the paper itself separating, and being therefore useless.

The tobacco-liquor sold varies much in strength ; it consists of tobacco-juice, water, and salt, with a certain quantity of common soda, and sometimes cheap salts of iron, as well as a little oil with which the juice is always charged. A certain quantity of refuse must be had in any tobacco manufactory, and this is washed into a tub to which juice is added from various sources. Some tobacco-liquors contain little active principle, and farmers should know that cheap liquors are merely coloured water, which is dear at any price. The material best calculated to give tobacco-liquor a proper colour and the appearance of great strength is treacle. To such an extent has the treacle been mixed with this material that it has been known to ferment in a cask, the end of which has been burst open in transit by railway.

Considering the nature and amount of useless materials added to tobacco-juice, and especially the quantity of water, treacle, common salt, and paper that farmers have to pay for, and which are purposely added to make the little available juice go further, and turn into much money, it is very desirable to have ready means to detect adulterations, and to enable us to determine the strength of tobacco preparations. On these points we shall have more to say in an early number.

---

## THE BREEDING OF HORSES.

*(From the Sporting Gazette, Feb. 20 1864.)*

SIR,—Breeding continues, as it ever must, to occupy the attention of those interested in stock. At this season of the year, more particularly than at any other, are owners of mares somewhat puzzled as to the sires they select to breed from. May, we, for the honour of this country, continue to maintain our pre-eminence over all other nations.



All connected with these realms, be they rich or poor, interested directly or not as the case may be, feel proud to assert that, equalled our breed of animals *may* be, surpassed they have not yet been, although foreigners select some of our best stock, regardless of price, with great good judgment and discrimination.

The are exported to foreign lands and bred from with care, the produce being nurtured very nearly to perfection; and some few have been re-imported back to this country to *eclipse*, as last season, our *very best two-year olds*! If these said re-imported "clippers" are born after the 1st January, the same as our own, without doubt we must look to our laurels, and not allow the moss to grow under our feet if we wish to maintain our valued superiority untarnished.

Skill, science, and sound judgment, invariably, when combined in the breeding of animals, meet their due reward. Money cannot purchase success, the prices willingly paid for successful breeding is sufficient to stimulate all to their utmost to attain prosperity.

Articles and opinions on breeding will continue to be criticised, discussed, and adopted. Many breeders are not content to be rational; they have *theories* of their own, that they are determined to carry out, at whatever cost in money, loss of reputation, however erroneous and unlikely to be successful.

That any one can lay down "laws" for breeding, that must result in success in all cases, is ridiculous; that any man can from the breed of any animal, positively assert that he is to be superior to all others, of same age and class, is equally preposterous. There is no doubt about one thing, that known purely and highbred tried families, with fine make, shape, and action, train on, and cut up much better than any man's judgment could detect, without a knowledge of the breed of such families.

Some trainers, men of great practical experience in cutting up and training horses, will tell you all horses that are thoroughbred have an equal chance. This is a great fallacy. Stout hearts, good dispositions and constitutions, are absolutely necessary for a colt to undergo the necessary training to test their stamina. Nine-tenths of those bred have not the recommendations of goodness in themselves to stand the test required of them, and when they give way, the cause is erroneously very often attributed to its wrong source. Barring accidents, which are exceptions that must be allowed for, I would have an Act of Parliament passed, that all soft-hearted, skew-made colts, that could not stand a proper training preparation, either at two or three years old, to win a weight for age, of some or any description of race, should be at once *castrated*.

And now the subject of castration has been mentioned, how advisable it would be to castrate scores of colts that are bred devoid of the qualities and formation likely to be of use as sires. They would, as geldings, stand wear and tear, and be as useful again for all practical purposes.

Trainers who are judges of breeding—which very few are—select strains of blood known to "nick" in producing running qualities, stout and good, combining soundness, action, and breeding to please a *connoisseur*; and there is very little doubt as to the result being successful and satisfactory. The best judges, who stick out for these points, have always the satisfaction of owning race-horses. Some of the known best trainers, who have honestly and truly gained a high reputation for sterling integrity, have a great many yearlings through their hands; and it not unfrequently happens that out of a great many they have few that render a good account of themselves. Out of every hundred horses they train, few are worthy of the name. Horses they cannot be called, for they are neither fitted for racing purposes, hacking, hunting, roadsters, or in fact any purpose for which horses are useful. Why is this so frequently the rule and not the exception? Simply, because the finest and best bred horse in the world, without *true formation, action, soundness, and stamina*, cannot compete successfully with those possessing these qualifications. Then it seems rational that breeders of horses should not blunder on in the dark; they should study to breed from highly proved stallions with true formation and symmetry,



without which the *action* cannot be *true* and *lasting*; and inasmuch as the stallion, in nine cases out of ten, moulds the locomotive power of the produce, both as to size and true formation, how requisite it is that the original should be perfect in this respect, as well as stout, good, and highly descended, with all other racing and good qualifications.

Many of our best horses, possessed of brilliant speed, courage, and stamina, are not adapted to hand these qualities, with any degree of certainty, down to their offspring, unless very carefully examined before they are made *beastly fat* in their weak points, and counteracted by being crossed with certain strains of blood known not to possess their idiosyncrasies—*i.e.*, peculiarities of temper, disposition, formation, soundness, &c., &c. Touchstone, Birdcatcher, Pantaloon, and Melbourne were all sires of undoubted repute. They are all dead. Their blood remains in their sons and daughters. Very few of the sons are worthy of the name, and those few must be prized beyond measure or value. Each of the beforementioned horses had peculiar differences in respect to their make, shape, and action. Their blood, when closely combined, nearly always resulted in something remarkable.

There is a long list of stallions advertised, that would ruin any man not a millionaire to breed from and train their produce. They cannot have mares put to them, even if selected from all England, suitable to their requirements. The best of mares will not breed successfully from cross-made, ill-formed stallions, devoid of *action*, except galloping action, on turf. Sires should not be high up, weak-framed animals, made up fat, and thought to be large. They should stand under rather than over sixteen hands, and have the width and muscle of Newminster. The framework of the sire—*i.e.*, the bones—must be properly placed, the shape should be perfect, and action to match, with breed that is pure and high class—sufficiently so to mark itself distinctly on the produce, from any and all classes of mares, however bred. This constitutes a stallion, one like old Sir Hercules, that got race-horses, steeple-chase horses, hunters, hacks, *ad libitum*. Sir Hercules was, without exception, the truest and best shaped horse for all purposes I ever beheld.

Breeders cannot make mares, hence they must use what class they can obtain, and make the best of them. Some mares suckle moderately, may be unhealthy in themselves at one time and not at another; they may be crossbred, although in the *Stud Book*; not judiciously crossed, curiously formed, and yet with all this the produce ought to be strongly marked, like the sire, *in formation*. The stallion is valuable in proportion to the quantity of good produce he gets, taking into consideration his chances, compared with the fashionable sire who obtains all the best selected mares, season after season, without rhyme or reason, because he may happen in his life to have got now and then one worthy of the name of "horse." The blind lead the blind—in breeding particularly so.

The stamina, soundness of constitution, and lasting qualities, experience proves, are more influenced by the dam than the sire. This does not apply in all cases, as many of our best tried and proved *racing mares* breed weeds, or crooked made animals, devoid of soundness to stand the test the trainer puts them to. Young, sound, healthy mares, that have not been trained to death, and when afterwards turned out to breed, comparatively starved to a shadow, are better for stud purposes; exhausted nature cannot be regenerated, and few of our best mares that are clipping racers have a chance at the stud; they are so frequently mismanaged, and sound judgment is not called in question in the treatment they receive, and the sire selected by their whimsical owners to propagate their species.

Pray pardon errors, as this is written hastily, and I may shortly review a few of the sires. I cannot subscribe to Dr Shorthouse's doctrine that because Adamas and Chevalier d'Industrie are well bred they are made like *horses*. Any judge of horseflesh, unprejudiced, cannot approve of animals *devoid of fore ribs, with twisted curiously-formed fore legs, elbows in, &c., &c.*—Yours, &c.

A BREEDER.



## MELOSSOON DIP.

*(From the Scottish Farmer, February 17, 1864.)*

THE composition advertised in our columns by Mr Robert Girdwood has been the subject of singular experiments, which are, to say the least, very unusual with dipping mixtures. Destructive as it is, especially in a concentrated form, to parasites, it is absolutely harmless, even when given in large doses internally to sheep. A small Cheviot hog received, on the 9th instant, 12 oz. of a strong solution in the proportion of one of the dip to five of water, which is about eight times the strength of the dipping mixture as used for killing keds. The sheep showed no signs of disturbance; was seen to eat within the hour after receiving the dose; it afterwards chewed its cud, and, in fact, was in no way affected. Its pulse and respirations continued quite normal, and it was evident that the dip had no more effect on the sheep than a dozen ounces of water. Another sheep received a larger dose with a like result; and there can be no doubt that the desideratum has been attained, of securing an article poisonous to parasites and quite free from noxious properties for man and the domestic animals.

## LEGISLATION FOR THE PREVENTION OF CONTAGIOUS DISEASES AMONGST ANIMALS.

*(From the Scottish Farmer, February 17, 1864.)*

SIR GEORGE GREY has stated from his seat in the House of Commons that two bills are to be introduced into Parliament by the Under-Secretary for the Home Department, having reference to the prevention of disease, to the sale of diseased meat, and the importation of diseased cattle. Unfortunately there is too much cause to hope for early legislation on these subjects, notwithstanding the remarkable statement that contagious diseases—and especially the dreaded lung disease—are dying out of the country. So far is this from being the case, that the outbreaks which have already come to our knowledge in only seven counties of Scotland exceed in number those of last year at the present time; and when fourteen weeks instead of seven of this new year have passed, we shall have further evidence to demonstrate how false is the notion gleaned from casual inquiry that the lung-disease is one of the plagues of the past. Since the 1st January, we have had occasion to witness, or receive reliable information concerning, the appearance of the lung-disease on two farms in Forfarshire, two in Perth, four in Fife, three in the county of Edinburgh, two in Linlithgow, four in Lanarkshire, and two in Ayrshire. At the rate of about a score of cattle affected with the lung-disease have been killed every week in the Edinburgh Slaughter-Houses, and many more have had their throats cut in the private slaughter-houses beyond the city boundaries. Both in Perth and Dundee the disease has been raging, and Glasgow has formed no exception. Some of the Edinburgh dairies have been free, whilst others have been very severely affected.

Not only has the number of outbreaks which have come to our knowledge exceeded the number of last year, but their severity has been remarkable. On one farm eleven animals have died within three weeks. On a second dairy farm the half of a large stock has been already swept off. We are not in possession of the exact number, but about a dozen are dead, and several others sick. On a third farm five animals died within a week, and the remnant stock was disposed of a fortnight back in the Edinburgh market. Where this remnant stock is gone to disseminate disease, we are left to conjecture. On four other farms we have been engaged in carrying out preventive measures, and in every instance the disease has been checked in its course. During the past week we have seen two lots of cattle from infected farms—one lot of these on Wednesday last in



the Edinburgh market, and another of four driven into the city on the 15th inst. These are our experiences without having made special inquiries, and the cases have come within the range of our observation on the occasion of professional visits in different parts of the country. We could enter into further details, but our object on this occasion is principally to show that the lung-disease is still raging here; and if our friends ask for further information, we are prepared with startling facts to prove that the sooner the traffic in diseased animals is checked the better for the farmer and the public at large.

## ON THE NATURE OF ACCIDENTS FROM THE USE OF POISONOUS DIPS FOR SHEEP.

(From the *Scottish Farmer*, January 27, 1864.)

THE prevailing notions that the more poisonous a sheep dressing is the more likely it is to destroy parasites and protect the sheep, must soon be generally recognised as an erroneous one. The poison which will kill a tick most rapidly will not kill a sheep, and *vice versa*. The list of accidents arising from the use of poisonous dips, smears, and pouring mixtures is such a long one, that it would be impossible to record even a few of the cases which occur during a single dipping season in this country. No attempt has been made to classify the knowledge possessed on this very important subject; and it may not be uninteresting to our readers to furnish a sketch of such a classification, however imperfect it may appear.

### 1. EFFECTS OF POISONOUS DIPS ON THE SHEEP.

Arsenic dips, which are the most generally used in the United Kingdom, are never deadly to sheep as the result of mere immersion of the animal in a bath unless the liquid is accidentally swallowed.

*a. Deaths after Dipping.*—After bathing, sheep are often poisoned from the grass they eat being impregnated with arsenic. The common and direct causes of such an accident are (1) crowding the newly dipped sheep on good pasture; (2) exposing them when their fleeces are still charged with much dip to a shower of rain, whereby the arsenic is washed on the grass and indirectly carried into the stomach.

*b. Loss of Teeth.*—The deleterious effects of arsenical baths, in consequence of the unavoidable introduction of arsenic into the sheep's system with the grass on which the animal lies, and which is eaten, are noticed more especially the third and fourth season on which any flock has been dipped with arsenical solutions. Such effects consist principally in diseases of the osseous system, and especially of the teeth. Thousands of valuable ewe flocks have been seriously deteriorated by their teeth dropping out prematurely as a direct result of arsenic dips.

*c. Caustic Action.*—The arsenic which is imperfectly dissolved at the bottom of a bath has been poured with a certain quantity of the liquor holding arsenic in solution on the backs of the sheep. The result of this has frequently been inflammation, sloughing, and ulceration of the skin, dropping off of the wool, and death of the sheep in from a week to a month. We have known fifty per cent. of a flock thus imprudently dressed carried off within six weeks after pouring.

*d. Loss of Wool.*—The loss of wool due to the caustic action of a dense mixture of arsenic, in which arsenious acid and arsenites are held in suspension as well as solution, is not the only form of depilation noticed. Chronic arsenical poisoning is indicated by inflammation of the eyes, a peculiar form of erythema or inflammatory eruption of the skin, which results in desquamations of the cuticle and loss of hair or wool.



It has been stated that arsenical washes are most dangerous in warm weather, and in warmer countries than our own. Mr Young of Kirkliston says, speaking of his Australian experience, that one of the solutions he has been in the habit of using is made by dissolving from half-an-ounce to six drachms of arsenic in a gallon of water "and in a solution of this strength," he goes on to say, "I have dipped as many as 2000 sheep a day, with, during cold weather, no fatal consequences ensuing. In warm weather, however, and especially if the sheep be in fine condition, the use of this solution is very dangerous; so much so, that in one instance, on using, during the summer, a solution containing only two drachms of arsenic to the gallon of water, 10 per cent. of the sheep (fat wethers) died. And in another instance, I may mention that a neighbour in December of last year (summer time in Australia) dipped a flock of picked ewes and lambs in an arsenical solution, the strength of which, however, I do not know, and the result was that 1300, being exactly one-half of them, died." Our experience would indicate that these accidents have been due to eating poisoned grasses, and we are confirmed in that view from the fact that in this country sheep are dipped principally during warm weather, and the accidents are not more common than in the winter. If they should prove to be so, we are inclined to ascribe this to the state of the grass, which in winter is scanty, and the animals have to travel widely to procure sufficient food; whereas in the summer they can pick enough over a limited area of ground. Moreover, sheep in fine condition move about less than leaner animals, and thus more readily poison their pasture after dipping.

Sheep are not addicted to licking themselves, and we cannot ascribe to this cause, as some persons have attempted to do, accidents after dipping. Occasionally, when sheep are fed on inferior hay—and especially in dry seasons, when the grasses are parched, as often happens in many of the Continental sheep-breeding countries—they are addicted to nibbling and swallowing each other's wool. This would, of course, be dangerous after dipping.

That sheep will greedily eat hay, straw, and grass wetted with arsenical washes we have had the opportunity of demonstrating. Mr H. Wilkinson, veterinary surgeon, Newcastle, performed the following curious experiment. He poured a strong arsenical solution  $1\frac{1}{4}$  lb. to  $22\frac{1}{2}$  gallons of water, made up as usual with sulphur and soft soap, on a strip of pasture about 23 yards long by 3 broad. This strip was part of an inclosed plot of ground, the area of which was 23 by 24 yards in extent. A couple of sheep were placed in this enclosure, and a few minutes after the mixture had been placed on the grass they ate freely of the latter, and though they had the range of considerably more pasture beyond the poisoned parts, they preferred to remain on the latter. Some oats had been steeped the previous evening in the same arsenical wash, and they were placed in a trough in the same enclosure. The sheep ate them freely, and partook of more than their usual quantity during the day, as if the arsenic had excited their appetite. The sheep thus fed on the 27th February manifested unmistakeable symptoms of arsenical poisoning on the 28th, and gave evidence of great distress.

## 2. EFFECTS OF POISONOUS DIPS USED FOR SHEEP ON OTHER ANIMALS.

It is a well-known fact that poultry, pigeons, pigs, calves, dogs, game, fish, cattle, and horses, are frequently poisoned by the reckless manner in which arsenical dips are used on farms. These cases of poisoning are due (a) to the accidental admixture of the poison with water or food; (b) to the discharge of the remnant of a sheep wash on a field or in a stream; (c) to the animals licking themselves or each other. Before entering into details on this section of our subject, it may be proper to mention that the use of arsenical baths has been condemned by persons of large experience, on the ground that the distribution of such poison over the country in unmanageable quantities can only result in the wholesale destruction of animals of one kind or another. Pro-



fessor Gerlach, the Director of the Veterinary College at Hanover, is opposed to these baths on the ground that they can be superseded, and that danger is to be apprehended from the dissemination of arsenical solutions over farms. Professor Himly supports this view, and believes that it is impossible to distribute poisons, as they are used wherever flocks are distributed, with impunity. We may now refer more particularly to the several heads above enumerated.

*a. Accidental Admixture of Poison with Water or Food.*—This occurs from vessels being used—as boilers, drinking and feeding troughs, or pails—for ordinary purposes, and negligently made use of at the period of dipping without attention being paid to their purification. The smaller animals are destroyed from arsenical solutions being thrown on manure heaps and about the farm-yard, so that grain and various materials which poultry, &c., pick up are poisoned.

*b.* The discharge of the remnant of an arsenical bath into a stream merits the strongest condemnation. Trout, salmon, and other fish are often poisoned in this way; and when the dipping operation is carried on in a field, the dip is discharged on the surface instead of being buried. Thus accidents of various kinds arise.

*c.* When sheep have been dipped, the residue is often preserved to dress cattle with that are affected with lice. This is a reprehensible practice, as the animals lick themselves and suffer. Shepherds are sometimes foolish enough to dip their dogs, and they are sure to lick their limbs and body, and are sometimes only saved by a violent emetic action. Many dogs have been killed in this way.

The common result of poisoning in all these ways is *garter enteritis*, with the ordinary symptoms of arsenical poisoning—viz., violent abdominal pains, intense thirst, vomiting, purging, tenesmus, reddened urine, depression, unconsciousness, paralysis, convulsions, and death.

### 3. EFFECTS OF THE ARSENICAL DIPS ON MAN.

There are few flockmasters and shepherds who have not witnessed bad results on themselves and others from arsenical preparations. Human beings have suffered both in the result of engaging in the operation of dipping the sheep and from accidents arising from the accidental admixture of the dip with food and water.

*a. Effects from Engaging in the Dipping the Sheep.*—All who have assisted at this operation can bear testimony to the kicks and scratches which cause abrasions of the arms and the splashing of liquid over the face and body. The abrasions which the shepherd especially suffers from when he holds the sheep by its horns have little tendency to heal after having being subjected for some time to contact with arsenical liquid. They ulcerate and suppurate. Sometimes the nails are destroyed and the matrix inflamed. This is usually due to the arsenic lodging beneath and around the nail, so as to act as a caustic, like an ordinary arsenical paste.

The worst form of accident due to the splashing of liquid has been observed on men engaged in dipping without any waterproof covering over the body and limbs. After a long day's work, during which a man's clothes have been thoroughly steeped with arsenic wash, inflammation of the skin, especially over the lower part of the body and limbs, occurs, extensive desquamation of cuticle, and even sloughing, follow, and the constitutional symptoms are often very severe. Many persons have nearly lost their lives from this cause; and there is a strong feeling against the use of poisonous compounds as sheep-dips, if they can be superseded, in consequence of these accidents.

*b. Effects on Human Beings from the Accidental Admixture of the Arsenic with Water and Food.*—One of the most interesting cases of poisoning in man with arsenical dip occurred some years ago in Peeblesshire. A packet of compound was placed on an iron beam beneath the roof of an erection over a well

destined to keep rain and dirt out of the latter. The constituents of the dip, especially the soda, were deliquescent, and gradually the packet gave way, and its contents fell into the well. Several persons suffered severely, and some died; but though this case has been reported to us by no less than three farmers, we cannot state positively how many persons died: according to one statement only one, and according to another three persons perished.

Another manner in which the arsenic dips have entered the human system has been with food. Persons have been killed from a batter pudding being mixed accidentally with dipping material. Arsenic has thus found its way into milk-pails, oatmeal, &c.

Our remarks have been applied principally to arsenic, which, from its cheapness and ready admixture in dipping compounds, has been used more extensively than any other poison. Its killing properties have also secured for it a preference over many less certain materials, though its efficacy in this respect has been greatly exaggerated, as it was for long believed that parasites could not live in a fleece for months after it had been steeped in an arsenical bath. This is quite wrong, and a very few days after a flock has been dipped with an arsenic compound, ticks are seen crawling in the wool and sucking the sheep's blood.

We may now allude to corrosive sublimate, which enters into the composition of many sheep dressings. It is decidedly more dangerous than arsenic, being more than twice as active as an internal poison, and a more vigorous caustic externally. Accidents have arisen from shepherds being supplied by chemists with corrosive sublimate when they have asked for mercury or rock mercury to use in a dip. Persons have resorted to corrosive sublimate for the treatment of scab, and have killed many animals thereby. A remarkable case occurred in Prussia in 1858. A scabby flock of 335 wethers was treated with a corrosive sublimate wash, in the proportion of ten grains to the ounce. In from fourteen days to three weeks the whole flock was destroyed. Kuhlmann, a veterinary surgeon, saw the flock when 225 had already succumbed. He noticed amongst the survivors the following symptoms—emaciation, loss of appetite, pendulent abdomen, awkward and hesitating gait, sunken head, pallid mucous membranes, and feverish symptoms in the worst cases, with the pulse at 120 or 130 per minute. After death the principal appearances consisted in dark-coloured flesh, fluid dark blood, with dark serum extravasated in the chest and belly. The liver was of a dark-red colour and flabby, and the lungs covered with blood-red patches varying in size from a shilling to a crown piece. Skin, liver, and blood proved on analysis to be strongly charged with corrosive sublimate.

Tobacco baths often sicken sheep, and throw them off their food for a number of days. The nausea is especially due to the tobacco getting in the food—grass, &c.,—which the animals eat. Gerlach has noticed symptoms of great depression and general derangement after dipping sheep in one of the ordinary tobacco baths. Tobacco liquor is more apt to kill animals which are addicted to licking themselves when it is used on them to kill parasites, and thus horses, cattle, dogs, and rabbits have been destroyed.

Black hellebore, which enters largely into the composition of some dips, is an active poison. Sheep are killed with doses varying from one to three drachms of this drug, which may be carried in large quantities into the stomach of the sheep with the ordinary tobacco and hellebore dips.

Spirit of tar, naphtha, paraffin, and other products of this description have killed sheep when used in too large proportions; and some of these compounds act by inflaming the skin, whereas others are probably absorbed.



## THE MINERAL THEORY.

By BARON LIEBIG.

The following article, interesting to us in a physiological point of view, has appeared recently in the *Agricultural Journals* :—

IN the last number of the “*Journal of the Royal Agricultural Society of England*,” there is a paper by Messrs Lawes and Gilbert, in which old charges against me, personal and others, are revived; and as they have sent an extract from that paper to all the Universities, Agricultural Colleges, and Journals in Germany, as well as duplicates to myself, it is evident that they attach a great value to their statements, and in order to give others the means of judging them correctly, I think it advisable to answer them.

In my “*Principles of Agricultural Chemistry*” (p. 90, 1855), I had called Messrs Lawes and Gilbert’s attention to the fact that their experiments included the proof that farmyard manure (organic manure) could be entirely replaced by *mineral* manure (for sulphate of ammonia and sal ammoniac are mineral); and therefore, so far from refuting my doctrine, they had really substantiated it. To this they replied, that *ammoniacal salts belonged to the class of organic manure*; that I had always considered them as such; and that in falling back on the strictly scientific meaning of the terms *mineral* and *inorganic*, I was begging the question—was trying by a *manœuvre* or *ruse* to give a new definition to my mineral theory, or rather to substitute for it another which was not my own. Although I tried to convince them, by a paper printed in the “*Journal of the Royal Agricultural Society of England*” (1856), that I never had considered *ammoniacal* salts an *organic* manure, they return to their accusations now, and endeavour to support them by quoting the following passages of my works :—

“But the weight or amount of the crops is in proportion to the quantity of food of both kinds, *atmospheric* and *mineral*, which is present in the soil, or conveyed to it in the same time. By manuring with *ammoniacal salts* a soil rich in available *mineral* constituents, the crops are augmented in the same way as they would have been if we had increased the proportion of *ammonia* in the air.”—*Principles*, pp. 77–8 (1855).

“The *mineral* constituents act, as is shown by the produce of the unmanured land, without any artificial supply of *ammonia*.

“The *ammonia* increases the produce only if the *mineral* constituents be present in the soil in due quantity, and in an available form.

“*Ammonia* is without effect if the *mineral* constituents are wanting. Consequently, the action of *ammonia* is limited to the acceleration of the action of the *mineral* constituents in a given time.”—*Principles*, pp. 86–7 (1855).

“... the other is the action of *sulphate of ammonia* as a solvent for certain important *mineral* constituents of the soil.”—*Ib.* p. 99 (1855).

“*Ammonia*, when used as a manure alone, and when there is a want of *mineral* constituents in the soil, is like the spirits which the labourer takes in order to increase his available labour-power—an imagination; and, like that stimulant, its action, in this case, is followed by a corresponding exhaustion.”—*Ib.* p. 106 (1855).

“A fertile soil must contain in sufficient quantity, and in a form adapted for assimilation, all the *inorganic* materials indispensable for the growth of plants.

“A field artificially prepared for culture contains a certain amount of *these ingredients*, and also of *ammoniacal salts* and decaying vegetable matter.”—Fourth Edition, p. 169.

It is scarcely necessary to multiply these citations. as the meaning of them is nearly the same.



The conclusion which is drawn by Mr Lawes from these passages is the following:—

“These sentences will be sufficient to show whether or not Liebig is justified in now attempting to fall back, in agricultural discussions, upon the more strictly scientific meaning of the terms ‘mineral’ and ‘inorganic,’ so as to include within them ‘ammonia,’ ‘ammoniacal salts,’ ‘atmospheric constituent,’ &c., and thus to give a new definition to his mineral theory, or rather substitute at this date for his own theory, which has proved to be erroneous, another not his own.”

It is quite true that I have contrasted *ammonia* with *mineral* substances; but the meaning of these passages must be obvious to any candid reader of my works. I said (Fourth Edition, p. 50):—

“No conclusion can have a better foundation than this—that it is the *ammonia of the atmosphere* which furnishes nitrogen to plants.”

In my *Principles of Agricultural Chemistry*, from which the first passages quoted by Lawes are taken, I said:—

“All these substances (phosphoric, sulphuric, silicic, and the alcalic, lime, magnesia, iron, &c.) are included in the term *mineral food* of plants. *Carbonic acid and ammonia are the atmospheric food* of vegetables.”—(P. 24.)

In my book I had to explain the relation of the atmosphere to the soil in the growth of plants, and to distinguish the elements furnished by the air and those by the soil, and to avoid, by contrasting them, a long tedious enumeration of each of these elements, *which all had been stated as inorganic*, I divided them into two classes—*atmospheric* and *mineral*.

I must admit that some scientific education is required for a man to understand that the word *atmospheric*, designating *gaseous* compounds, like the word *salt* (for ammoniacal salts), in whatever connection they may be used, entirely exclude the idea of *organic*. We speak frequently of salts of organic acids (acids derived from organic compounds), but a salt itself is never called organic, because it is exactly the opposite of organic. As to the term *mineral constituents*, I showed in the 8th chapter of my book that the *constituents of ashes* are *originally constituents of minerals*—thus, potash a constituent of feldspar, phosphoric acid a constituent of agratite, &c.—(See also chapter 9 on Formation of Arable Soil, and chapter 12 on Fallow.)

From this it will be understood why I used the word *mineral constituent* to designate the constituents of ashes, sometimes of soils, but never for ammonia.

*Ammonia* is a constituent of the atmosphere, but is *never a constituent of any mineral*: it is *mineral and inorganic*, but not a *mineral constituent*.

For a man not versed in scientific language there is some ambiguity in the word *mineral*—at least in Germany we say *sulphate of ammonia is mineral* (in its origin), and the mineralogists say *sulphate of ammonia is not a mineral* (species); but this has nothing to do with Lawes and Gilbert’s accusations.

Although the word *organic* does not occur in any of the sentences quoted from my works, and is never associated with ammonia, although I distinctly stated that the opposite of *mineral constituents* was *atmospheric*, they affirm that by *atmospheric* I understood *organic constituents*. Their mode of arguing is most simple. They take any passage out of my book, twist their own erroneous idea into it, and then assert that, by contrasting ammonia with mineral constituents, I had regarded it as an *organic* manure.

The origin of Messrs Lawes and Gilbert’s wonderful statements can scarcely be understood without referring to a definition of manure which Mr Lawes gave in 1847, and which he is pleased to call his theory. It is the following (*Journal of the Royal Society of England*, vol. i. p. 240.):—

“I NOW COME TO THE ACTION OF MANURES, WHICH are generally divided into two classes—*organic* and *inorganic*. ALTHOUGH THIS DISTINCTION IS BY NO MEANS SATISFACTORY, I SHALL ADOPT IT AS BEING GENERALLY UNDERSTOOD. Organic manures are those which are capable of yielding to the plant, by decomposition or otherwise, ORGANIC MATTER—carbon, hydrogen, oxygen, and nitrogen—con-



STITUENTS WHICH UNCULTIVATED PLANTS DERIVE ORIGINALLY FROM THE ATMOSPHERE. Inorganic manures are those substances which contain the mineral ingredients, of which the ash of plants is found to consist."

Before I enter on any discussion of this definition or theory, I must beg to recall the views on the food of plants which I published in the year 1840. They are contained in the following passage:—

"The elements of nourishment of all green plants are inorganic or mineral substances."

"The plant lives on carbonic acid, ammonia, water, phosphoric acid, sulphuric acid, lime, magnesia, potash, iron; and many, too, require common salt."

As I did not admit the existence of organic food, my theory was called *mineral theory*. This name was correct, inasmuch as it was directly opposite to another theory which prevailed before 1840.

According to De Saussure, Sprengel, Thaër, &c., there were two different laws of nourishment, and two kinds of manure, *organic* and *inorganic*.

"*Uncultivated plants*," says De Saussure, "receive their combustible elements from the air, their carbon from carbonic acid; but the products generated from this kind of food possess no value for agricultural purposes. The normal development of *cultivated plants*, on the other hand, and the amount of produce of arable fields, depends on *organic* matter in the soil, on residues of fermentation, and decay of *animal and vegetable matter*."

"Fertile soils contain a mixture of these remains, and their absorption by the roots is a powerful assistance to the food which is contributed by the air and water."

"Plants receive their nitrogen almost entirely by the absorption of the soluble organic substances."

"Mineral substances, marl, gypsum, clay, lime, favour the growth of plants, but take no part in nourishment."—(See *Bibliothèque Universelle*, t. 36, p. 430; *Ann. of Chemistry*, t. 42, p. 235.)

This view, it will be seen, is diametrically opposed to my theory, inasmuch as De Saussure maintained the necessity of *organic* food for cultivated plants, and I denied it altogether.

At first sight, the so-called theory of Lawes, or his definition of manure, would seem exactly identical with that of De Saussure. Mr Lawes assumes the existence of different laws for cultivated and uncultivated plants, and of two classes of manure, *organic* and *inorganic*, just as De Saussure and Sprengel maintained; and most certainly Mr Lawes does not claim this theory as his own, but states that it was generally understood, though by no means satisfactory.

There are, however, two essential differences between Mr Lawes' so-called theory and that of De Saussure. First, that Mr Lawes admits the existence of *inorganic food* or *manure*, consisting of the substances contained in the ashes of plants. The second, that Mr Lawes applied the name of *organic* manure to something very different from what De Saussure meant. For the first, De Saussure knew nothing of the fact that the ashes of plants were nutritive elements; for he maintained that they (for instance, potash, lime, magnesia) were variable ingredients, changing with the geological formation and character of soils. I think no one can deny that I was the first to point out that the elements of the ashes were really food of plants, and Mr Lawes has most certainly no claim to this essential part of my theory.

As to the second, by organic manure De Saussure meant genuine organic matter. Mr Lawes, however, has not the slightest desire to prove that the *vegetable mould* of Sprengel, or the organic extracts of De Saussure, are necessary ingredients of an efficient manure. On the contrary, all his experiments tend to prove that these substances, which cannot be produced in a manufactory, are not necessary. What then does Mr Lawes mean by organic manures?

The candid reader will be puzzled to learn that Mr Lawes' theory, correctly



expressed, is exactly the same which I published seven years before his definition of manure: That the action of manure depends on two classes of bodies. The combustible part of plants derive their carbon, hydrogen, nitrogen, and oxygen, from *carbonic acid*, *ammonia*, and water; the incombustible parts of plants consist of phosphoric, sulphuric acid, potash, soda, lime, magnesia, silica, iron; that "stable manure, the excrements of men and animals, do not influence vegetable life by means of their organic elements, but indirectly by means of the inorganic compounds which decomposition and slow combustion produce; in consequence therefore of their carbon being changed into carbonic acid and their nitrogen into ammonia. Thus organic manure, consisting of parts or remains of plants or animals, may be replaced by those inorganic compounds into which it resolves itself in the soil."

The difference between Lawes' theory and mine is simply this—that he has *borrowed the substance of mine* and the *terms* of De Saussure's theory—that he calls ammonia, carbonic acid, and water, which I had called *atmospheric food*, *organic manures*!

There is still a question to be solved: Were these three substances classed by Lawes as *organic manure* generally understood by that name?

Now, it is perfectly certain that neither De Saussure nor Sprengel employed the term "organic" to denote these three substances which they knew as inorganic. This denomination can therefore not be referred to them. There exist, moreover, no chemical works published before or after Lawes' definition (1847), in which they are classed as *organic food* or *organic manure*. It was, consequently, *not generally understood* that ammonia, water, and carbonic acid *belong to the class of organic manure*. The part of Mr Lawes' theory which belongs to himself is merely this erroneous nomenclature. I repeat that the terms of his definition of manure he has taken from De Saussure. The essence of it is simply mine; but the manner in which he has tacked De Saussure's terms on to my meaning is purely his. We must let him have the credit of the invention, and a monopoly of the property.

I cannot think that the humblest teacher of chemistry in Great Britain would be content to accept a theory from a man who shows such ignorance of the first elements of chemistry as Mr Lawes; and yet Mr Lawes has the conceit to make believe that I had adopted his definition of manure seven years before he gave it, and that, although *it was by no means satisfactory to himself*, it was perfectly satisfactory to a German professor of chemistry.

Mr Lawes accuses me of a *manœuvre* and a *ruse*; and I convict him of trying, by a false definition, to annex a theory which I have the sole right to claim. It is obvious that his definition of manure would be perfectly satisfactory if *his* word *organic* were changed into my word *atmospheric*, and carbonic acid, ammonia, and water included in the term *inorganic*, to which they are universally assigned. Messrs Lawes and Gilbert's conclusions belong to that class which goes under the name of *Fallacies of Confusion* in John Stuart Mill's "System of Logic," and which comprehends, among others, all those which have their source in language, whether arising from the vagueness of our terms, or from casual associations with them, in which no other causes can be assigned for the mistake committed than neglect or inability to state the question properly, and to appreciate the evidence with definiteness and precision."

If the leading idea of my work is borne in mind, as it is stated in the following passage (Fourth Edition, *On Manure*, p. 186)—"A time will come when plants growing upon a field will be supplied with their appropriate manure, prepared in chemical manufactories, when a plant will receive only such substances as actually serve for its food, just as at present a few grains of quinine are given to a patient afflicted with fever, instead of the ounce of wood which he was formerly compelled to swallow in addition." It will be seen that all my statements and endeavours were directed with a view to oppose the ruling idea that *organic* manure was necessary to preserve the fertility of fields, and to increase the crops. The prejudice in favour of their necessity had grown to be



a dogma ; and the progress of agriculture depended on the farmers becoming aware of their error.

My whole book may be described as an uninterrupted protest against the existence of organic food of plants ; for organic matter cannot, in the nature of things, be produced by chemical manufactories ; and, if they were really necessary, chemistry could afford no assistance to agriculture.

If any one will consider the real cause of this sixteen years' controversy, he will be aware that it is a false definition of manure. If Messrs Lawes and Gilbert had not classed ammonia and ammoniacal salts among organic manures, a dispute upon my theory would have had no excuse. There is something so degrading, from a scientific point of view, at the bottom of this controversy, that those who have taken part against the only scientific doctrine which agriculture possesses will look back with shame when a few years have elapsed ; but there is nothing humiliating to me, although much that is highly annoying, for I am not so proud as to think myself humbled when I am fulfilling the vocation to which I have devoted my life—that is, of instructing others. To suppose that in this controversy I was influenced by personal motives would simply be absurd. When I strenuously endeavoured to make the agriculturists view things rightly, it was not for their own sakes, but in order to ward off future evils and the imminent dangers which threaten society at large. Every man of intelligence must see the strongest confirmation of my teaching in all the facts produced in this dispute. Every single experiment of Messrs Lawes and Gilbert brings new evidence in its favour ; and every doubt must disappear by the creation and progress, in all countries of Europe, of an immense branch of industry—the fabrication of artificial manures from inorganic or mineral substances, which is now extensively employed.

Mr Lawes' definition of manure, though false in itself, may yet have had, perhaps, a good effect in diffusing more widely these artificial manures, *which are all, without exception, mineral manures*. The prejudice in favour of organic manure was so strong that many agriculturists accepted, under that name, artificial manure which they would have refused under the name mineral manure ; and Mr Lawes, acting on his definition, could give, in all conscience, the assurance that their manure for corn contained the *organic* constituent which is most efficacious in stable-dung.

---

### BRAXY : A MORSEL FOR PROFESSOR GAMGEE.

(From the *Medical Times and Gazette*, February 20, 1864.)

SIR,—I perceive, by an article in the *Lancet* of last week, that Professor Gamgee believes he has demonstrated the “ danger of slaughtering diseased cattle.” The evidence he brings forward is, that an ox was ill with pleuropneumonia, or, as the Professor intimates, with something worse ; and that he was slaughtered by a drunken fellow on the farm, who, shortly before, had inflicted a severe ragged wound on his hand by a chop from a spade. This man died in a few days of diffuse inflammation of the arm ; and, besides, four pigs and two dogs who feasted on the bull's viscera were seriously ill in consequence.

We may ask, when will medical men and sanitarians learn a little of the value of logic, and of the laws of evidence, and refuse to bring forward defective instances like this ? If Professor Gamgee were not so absorbed by the search for facts to suit his special purpose,—a most excellent and laudable purpose, no doubt,—he would remember that the archives of surgery are full of cases of drunken men who die of diffuse inflammation after even more trivial injuries than this, and that, therefore, the case before us proves absolutely nothing.

Don't let it be supposed that I am blind to the filth and indecency of eating diseased meat. Only, in this as in every case, every exaggeration, and every doctrine sought to be proved without due evidence, does but recoil on our heads and weaken our cause.



There is no doubt but that large quantities of *braxy*—i.e., mutton which has died of disease—are consumed in Scotland; some of it, too, finds its way southwards, in the shape of *mutton hams*,—a food relished by Cockney tourists, but which the *callidus viator*—your knowing man—rejects with disgust. Being desirous of knowing something more about the popular use of it (I had read of it in Hugh Miller's Autobiography), I wrote to a philosophical, but non-medical, friend who lives in the Highlands, and forward his answer to your valuable Journal. There are one or two personal matters in it which I don't leave out, because they may show the more forcibly the intense horror with which the subject is regarded by my friend. Will Professor Gamgee take up the tale, and tell us whether any, and if so, what symptoms are observed amongst the shepherds who dissect and eat this horrid stuff!—I am, &c. D.

MAY-FAIR, February 15.

“ . . . I am going to make a very abrupt transition to your grand question, the subject of which, however (*horreo dicendo*), don't smell of the perfumes emanating from 'Macassar.' You ask, What is *braxy*? Well, Doctor, to tell the truth, I would as soon have expected the Archbishop of Canterbury to put the question as you. You were previously wandering among the highest regions of art, squinting here and there at architecture, hymnology, cathedrals, and church service, and now you come down pat with—'What is braxy?' It reminds me of a person enveloped in a delicious cloud of incense, and then going away to have his olfactory nerves regaled with the strong effluvia of a dissecting room. Well, I am not particular about smells, but certainly my mind made an inward protest against your rapid descent from 'the beautiful and sublime' to Scotch braxy. Here goes, then. After having deeply pondered upon the many questions which you proposed about dead sheep, and having called in shepherds and farmers to aid me with their counsel and experience, I find myself vastly illuminated, and quite prepared to treat you to 'braxy' scientifically.

“ 'Braxy' is a word whose etymology is nowhere to be found; it still lies among the '*recondita et obscura*.' In Gaelic it is spelt thus: 'bragsaid;' the word approaching nearest to it is 'braghad,'—a throat, windpipe, &c. The disease known under this name is an accumulation of water between the flesh and the skin, a swelling at the throat, and the bowels very much constipated. If the carcase of a sheep, defunct of 'braxy,' be not found by the shepherd at least fifteen hours after its exit from the cares of this life, no mortal ingenuity can convert it into an article of food; but if it be found within the fifteen hours, it is first bled, then skinned; but the stench is horrible—it penetrates the tightest doors, and any quantity of them. It is not only loathsome, but its strength overpowers and makes you fly to windward instant. When the flesh is cut up in the midst of these horrible effluvia, the parts are washed, then buried in a barrel, with salt and water heaped about them. After this process they are withdrawn, with a much less offensive smell, then salted and pickled, and hung up in a kitchen to be smoked. When a few weeks have passed, braxy ham is equal, if not superior to any other hams. The change is most wonderful; in fact I have partaken of it, and fancied that it was choice morsels of dried beef ham that I was devouring. But you may be sure that shepherds have not the patience to wait until braxy reach this stage of perfection; they bolt down whole masses of it, with its virgin smells pretty strong yet. The causes of 'braxy' disease have not yet been accurately determined by the knowing ones in the sheep line; at most we can only give negative causes. Thus, sheep never or seldom die of this complaint if fed upon turnips, or upon the low grounds lying close to the sea-shore tide-marks. They never die of it in summer; winter and spring are the fatal seasons. Some imagine that it is brought on by the hard, crisp, and dry grass which they are compelled to eat at these periods; others, &c., &c.—but there are innumerable theories—for sheep science would not be worth anything unless it split men into a multitude of opinions and conflicting theories.”



## THE ORIGIN OF COW-POX AND THE NATURE OF THE VACCINE VIRUS.

Debate in the Academy of Medicine.

(*From Gaz. Médicale de Paris, November and December 1863*).

M. BOULEY has recently brought before the notice of the Academy of Medicine some instances in which he had been successful in producing the vaccine pustule by inoculating with matter taken from the vesicles of an aphthous stomatitis occurring in the horse. The inoculation of the udder of a cow with this matter produced a crop of vaccine vesicles, from which several children were successfully vaccinated. M. Bouley was hence led to suspect that the vaccine disease might be produced indifferently by several different maladies which occur in the horse. This opinion, however, he subsequently renounced. M. Dupaul, in the course of the debate, announced the following conclusions as the result of his investigations:—

1. That vaccine virus (as a thing separate and apart) has no existence.
2. That the pretended vaccine virus, which we consider as antagonistic to and neutralizing the variolous virus, is no other than the variolous virus itself.
3. That the equine and bovine species are subject to an eruptive malady which is identical as regards its nature with the variola of the human species.
4. It is almost demonstrated that the same is the fact as regards several other species of animals, pigs, sheep, goats, dogs, apes, &c.
5. The local and general phenomena which the animals present are the same as those observed in man. The only differences as regards the pustules are those which depend on the structure of the skin and on the number of the hairs.
6. As in the human species so in the bovine and equine, variola may appear sporadically and epidemically.
7. From the horse we may easily inoculate the cow, and reciprocally.
8. From the cow we may inoculate without difficulty individuals of the human species, provided that they have not had spontaneous or inoculated variola.
9. From the horse we might also, without doubt, inoculate man, but hitherto experiments have not been tried, because the horse is subject to several other grave maladies which might be inoculated at the same time.
10. The cow, the horse, and several other species may be inoculated with variolous matter from the human species.
11. When a variolous epidemic occurs amongst men, it often extends itself by contagion to other animals.
12. An epidemic of variola may commence amongst animals and extend to man.
13. Inoculated variola produces a much less degree of general reaction than does variola developed by contagion. This is true in the human species, and especially in other species of animals.
14. The pustules which result from inoculated variola are often limited to the points of inoculation.
15. When a secondary eruption is produced, it is almost always insignificant, and composed of a small number of pustules.
16. In a general manner, we may say that the variola of animals is more discrete and less severe than that of the human species.
17. The dangers of inoculation of variola in man have been much exaggerated. The unprejudiced study of what has been written on the subject will convince of this.
18. It is probable that animals, as man, are subject to aphthous eruptions.
19. But the *maladie aphtheuse*, as it is described by several modern writers on veterinary medicine, is nothing else than variola.

At the meeting on the 1st of December, M. Rufz de Lavezon reported to the

Academy a series of inoculations which had been made in the Jardin d'Acclimation, on several animals belonging to the menagerie, by Dr Auzias Turenne and M. Mathieu.

On the 20th of October, a horse, which had been brought from England a fortnight before, was discovered to have a number of very fine pustules developed in its mouth and on various parts of the body. On the 23d and 26th of October, the mouth and nose of a second horse were rubbed with saliva obtained from the aphthous mucous surface of the first. Some pustules, exactly resembling those of the first horse, were developed on the rubbed surfaces. With matter taken from the second horse, a cow was inoculated on the vulva and a bull on the ear. The result was the production of a magnificent cow-pox. From matter taken from the bull, a zebu, a Javanese mare, a Siamese horse, and a Shetland mare, were inoculated. In all these animals inoculation gave positive results, and produced similar fine pustules.

---

## WILLIAM HARLEY AND HIS DAIRY SYSTEM.

*(From the Journal of Agriculture, January 1864.)*

So far as we can find, but very scant justice has been done in agricultural works to the memory of the man who was the first in this country to supply, on a large scale, our city populations with that most healthful, most nutritious, and most indispensable of household necessities, pure fresh Milk. Of course it may be argued, in justification of the neglect, that the practice of fifty years ago, however excellent then, is of no value now, and that an account of the Willow Bank Dairy would be of no practical advantage to the dairyman of the present day. But this mode of reasoning would be equally effective against the publication of any narrative of the voyage of Columbus for the discovery of the American continent, because our sailors do not now follow the ocean track of the great Genoese. Our own opinion is, that the world should be chary of forgetting its pioneers in any branch of invention, discovery, or industry. However small the improvement the invention effects, however meagre the discovery, or slight the advance in industrial science, we may rest assured it is worth while ever and again to recognise these and the men to whom they were due; and not merely as evincing our gratitude, but because such recognition tends to stimulate men living to emulate and excel their predecessors, and so, independently of the pleasant feeling which gratefulness brings, we may reap substantial benefit as well. For, as in this land,

“ Freedom broadens slowly down,  
From precedent to precedent ;”

so does progress in the arts and sciences “ creep from point to point ;” and it is essential to the knowledge of the advance we have made to turn back now and then to look at the points we have left.

In some such spirit, and to some such end, is it, that we wish to recall, briefly, the life and labours of a man who, as we have said, seems to have been strangely neglected by other agricultural authors.

William Harley was a man of no small note in his day. He was honoured by the patronage of not a few noblemen in the land, who appear to have been actuated less by the feeling of proud condescension, which the position of patrons usually implies, than by a real belief in the excellent and deserving nature of Harley's work. His dedication to the volume in which he gives an account of his dairy system is of so singularly comprehensive a character, and so free from the customary sycophancy of dedications of the time, that it is worth while to quote it here. It is as follows :—

“ To her Grace the Duchess of Leeds ; the Members of both Houses of the British Parliament ; and other Noblemen and Gentlemen, the author's patrons.



May it please your Grace, my Lords and Gentlemen:—To you, and especially to that exalted patroness who has conferred upon me most distinguished marks of kindness and condescension, I respectfully dedicate the following pages, illustrative of an attempt (I hope I may call it a successful one) to benefit the public. The imperfect system of dairy husbandry which had long prevailed, suggested to me the conviction that important improvements were attainable in this valuable branch of rural economy. To accomplish these in a manner that should render them worthy of universal imitation, required no inconsiderable capital, much practical knowledge, and incessant personal attention. Such, at least, were the desiderata impressed upon me in the progressive formation of, and long before I had ultimately succeeded in perfecting, the Willow Bank Dairy—an undertaking which the citizens of Glasgow, and many of you, my Lords and Gentlemen, in the visits with which I was honoured, have been pleased to speak of in terms that it would ill become me to repeat, but the flattering kindness of which is associated with my happiest recollections. As senators, ever alive to the protection which British agriculture in all its useful varieties claims from you in your legislative capacity, I submit the history of my humble labours to your impartial review; and as subscribers and patrons, I am proud in the opportunity thus offered me of testifying the readiness with which you are respectively known to encourage the exertions of individuals who disseminate their knowledge with a view to public utility."

There is a genuineness about this utterance one cannot help liking. It is the true expression of the sentiments of an honest man, and not vulgar flattery.

Harley was a native of Perthshire, having been born amid the Ochils, at a place called Glendovan. He was left an orphan at an early age, but he had excellent up-bringing from his grandmother, who was a woman of good intelligence, sound common-sense and kindliness of heart, combined with great firmness. As indicative of the latter trait in the character of the Lady of Whiteridge (for by such name was she known, her income being derived from a property called Whiteridge), it is mentioned that, on one occasion, during the Rebellion of 1745, the Pretender sent to claim feu-duty for the land which she held from the Crown, the alternative of refusal being the reiving of the cattle on the land; but the "Lady" having previous warning of this friendly visit, transported all the animals to a distant locality, and then, on their arrival, peremptorily refused to pay the duty. She had the sagacity, however, to entertain the tax-gatherers liberally, and also to furnish them all on their departure with a "whang of bread and cheese," or other palatable commodity, which so delighted the not over-well-fed followers of the Prince that she was never more molested.

While Harley was yet a youth, how old we know not exactly, for in his brief memoir he does not condescend upon the date of his birth, he removed to Kinross, to learn with a maternal uncle the art of weaving sattinets. Such an occupation was sadly against the grain at first, for the young gentleman was proud withal, and had a very low idea of the social standard of a weaver. Indeed he had so poor an opinion of the respectability of a man who gained his living by working the treddles and throwing the shuttle, or by employing others to do it for him, "that he considered the distinction to be but a shade between a weaver and 'a finisher of the law.'" However, at Kinross he soon got over that unworthy prejudice, and seems to have applied himself to the business with zeal and assiduity. From Kinross, where he learned to make fine linen, he proceeded to Perth to acquire a knowledge of the manufacture of brown linen, and from thence he was transplanted to a manufacturing establishment in Glasgow in 1789. Applying himself to business here as keenly as he had done elsewhere, he obtained sufficient acquaintance with the cotton manufacture to enable him to commence business on his own account in 1790.

In 1794 Mr Harley introduced a new article of manufacture—viz., that of Turkey-red checked gingham—a species of goods which, up to this time, were unknown in our country. During the first season he manufactured this com-



modity exclusively for an Edinburgh merchant; but it became so popular in a short time, that London took large quantities of it, and it was also largely exported to the West Indies. In 1802 Mr Harley purchased a few acres of ground, for the purpose of erecting a family residence thereon, at Sauchy Hall. Here he found a plentiful supply of fine fresh water, of which Glasgow (for then Loch Katrine was undreamed of as a reservoir to furnish water for the toddy of St Mungo's citizens) was very much in want. With the spirit of a philanthropist, as well as the shrewdness of a man of business—two qualities which were combined in Harley in a remarkable degree—he had carts and four-wheeled carriages constructed to carry the water daily from his property for sale at a small but remunerative price in the city. The success of this scheme paved the way for the formation of a Water Company, when, of course, the Willow Bank water was unneeded. Harley, however, did not let it run to waste. Hot and cold baths seemed to be a desiderata in Glasgow, and these he immediately erected. The success was very considerable—a good many invalids especially taking advantage of them. Glasgow was not then the overgrown city it now is, and Sauchy Hall, instead of being almost in the centre of the town, may be said to have been wellnigh in the heart of the country. At all events, it was so far away from shops that a wish was expressed by the visitants to the baths to have a drink of milk as a refresher after their long walk. Harley, in compliance, sent a cow to be milked at the baths, and this was the foundation of his great dairy, which attracted the attention of even the kings and princes of Europe. Not to break the narrative of this brief memoir, however, we shall delay the notice of the dairy until we mention the few other leading facts in the life of its originator. Harley's next act for the public good was the formation of a market-garden at Blythwood, with which he supplied the city with fresh vegetables, fruit, &c. A portion of the land was laid out in arbours and bowling-greens, with tasteful walks, &c., and here the Glasgowiegians came out to enjoy themselves on fine summer afternoons. Harley, by the purchase of the lands of Enoch Bank, next opened up St Vincent Street, George Street, Renfrew Street, Bath Street, and Nile Street, and afterwards, by building upon them, may be said to have originated the New Town. Nile Street was founded upon arches, and Harley, who put everything to use, converted these into ice-houses.

The baking trade in Glasgow was at that time carried on by people whose practices were not always of the most honest kind. Harley was pressed to become a baker on a large scale by many of the most respectable of his fellow-citizens. He at first refused, but after being continuously importuned for about two years, he finally consented. The same success attended his operations here as in his other avocations. His bread was greatly superior to that of all others, and, as a consequence, he received large custom, not only in the city, but in every district on the coast where the bread could be obtained.

Harley did not confine himself to the promotion of the physical comfort of his townsmen; he also exerted himself to secure the moral welfare of the young. At the time he went to Glasgow the citizens had each in their turn to do nightly the duties of policemen, these useful functionaries not being then an institution of our land. "In the author's turn," says Harley, "to perform that duty, it constantly occurred to him to be a witness of such deplorable scenes of vice and depravity, as to impress upon him the conviction that, if some feasible plan were devised, and followed up with resolution of purpose, much of this dissoluteness might be reclaimed. With a view to obtain this desirable end, and with the co-operation of others in advice and assistance, a number of Sabbath-schools were opened in the city and neighbourhood for imparting religious instruction to the children of the poor, the author's clerk keeping an account of the number of schools, scholars in each," &c.

From the dens of the city, Harley, by kind entreaties, promises of little presents, &c., persuaded the young Arabs, and Arabs of an older growth, to enter his schools, and, in the course of two years, about 400 children and adults, who,



at the time they were picked off the street, did not even know the alphabet, had been taught to read the Bible.

One is inclined to wonder how so much, in such a variety of undertakings, could be accomplished by one man. Harley himself gives an explanation. "If it be asked how a single individual could project and properly conduct so many different concerns, it is answered, that it was not from any vain opinion of the competency of his own abilities, but in a judicious division of *time* and *labour*, and in the uniform adoption into every department of that comprehensive word *system*—these may be said to have been the regulating powers of his extensive machinery. The motto, in short, throughout his establishments was, 'Every man at his post and doing his duty.'"

With the peace succeeding the battle of Waterloo came a reverse in Harley's fortunes, which he describes as paralysing his exertions, and as having "produced a revolution in his operations which formed a source of deep regret on many accounts, but especially as regarded the throwing out of employment so many necessitous workmen and faithful servants (some of whom had been with him nearly twenty years), and the compulsion that was imposed upon the author to discontinue his contributions to several institutions which he had assisted to establish."

Harley appears afterwards to have gone to London to establish a bread manufactory similar to that he had set a-going in Glasgow, and he was in London at the date of writing his preface in 1829. At that time it was in contemplation to erect, under his management, a small dairy after the Willow Bank pattern as a model. We cannot find, from the cyclopædias of biography, which often busy themselves with people to whom the world is much less indebted, anything of the after-life of this man, who, coming as a stranger into Glasgow, left it so permanently benefited and improved.

When, in 1809, Harley founded his dairy, Glasgow was very badly supplied with milk. It was selling at eightpence per Scotch pint, which was exactly four times the price it had been a quarter of a century before. The supply was deficient even at this then high price; what was still worse, the quality was execrable, both on account of the bad management of the dairies and the practice of adulteration almost universally resorted to by the dealers; and besides being cheated in the quality, the public were also swindled in the quantity of the milk. There was no standard measure, and the buyers were obliged to be satisfied with what the dealers chose to give. "As an instance to what extent the want of system was carried, and the random manner in which the dairy business was conducted, each dealer had measures suited to his own peculiar views; that is, they were either very small or middle-sized, according to the measure of his own conscience; and it not unfrequently happened that when, in the winter season, the quantity was diminished, instead of getting new measures of a still smaller size, the sides of the summer measures were beaten in to reduce their dimensions, thus adapting the quantity they should hold to a winter price."

Harley commenced the business of dairyman, after finding his own cow's milk at the bath taking so well, by building a dairy capable of containing twenty-four cows. All the dairies then, as indeed they are too often still, were in dark, dirty, close localities; and the cowhouses themselves were ill lighted, badly ventilated, and, in general, very far from cleanly. Indeed, cleanliness was almost impossible under the circumstances. Harley selected for the site of his experimental dairy a fine, airy situation at the head of Nile Street; and he showed equal sagacity in securing plenty of light and ventilation. The cows were arranged in double rows, face to face, as in the best dairies of the present day, with a passage between for supplying the food without disturbing the cattle. The praise of the milk from this dairy was soon in everybody's mouth. No wonder; for, besides being vastly superior to that they had been in the habit of receiving, it was twopence per pint less—being sold at sixpence instead of eightpence—and the measure was honest. The success of the dairy



was such as to render an immediate extension necessary. This was immediately set about, a building for the accommodation of a hundred cows being erected. This was the dairy which excited the admiration of all who beheld it, and the fame of which was so noised abroad, that it became one of the "lions" of the time, and a much more useful lion, too, than such "public beasts" usually are. The site was the same as that occupied by the old dairy, which indeed was made to form part of the new. Being on an inclined plane, the building was reared upon groined arches, divided into three apartments by transverse walls. In the centre division was received the dung from the dairy, whence it was easily carted away. Another division was fitted up for cows that were dry and prepared for fattening, for Harley sold off all his cows that had ceased to yield him so much milk as they ought to do in a fat state to the butchers. "This apartment, being quiet, and having little light, was deemed better adapted for carrying on the process of fattening than the other cow-houses, darkness and quiet greatly contributing to assist the progress and make the cattle much sooner fit for slaughter." The third division was appropriated as a cellar for holding provender for the cattle, and being well ventilated, answered the purpose remarkably well. Thus the inequality of the ground, which many would have deemed a great disadvantage, was actually turned to profitable account. The proprietor also further took advantage of the situation on the incline, to run down the urine of the cows into a large tank fifty feet long, six wide, and six deep. Nothing was allowed to go to waste at Willow Bank.

The main building, which contained, as we have mentioned, one hundred cows, was ninety-four feet in length by sixty-three in width inside the walls. Its height was nine feet, and it was covered with three roofs, in a pavilion form, the central one being twenty-four feet wide, and the others nineteen and a half feet each.

"These roofs rested upon two longitudinal beams, supported by cast-iron pillars. There were no horizontal ceilings; the slates were hung to the rafters on pins, and were not lime-pointed, but had a good cover. This mode saved a considerable expense, ventilated the house better, and was found warm enough for cattle in the coldest weather. There were thirty windows in the roof, each three feet six inches by one foot eight inches, hung with hooks and eyes, and having a latch-handle fastened to the bottom of the frame, inside, to admit atmospheric air at pleasure, and promote ventilation. There were four windows in each side of the roofs, and one at each end. In warm weather, part of the doors and windows were opened, and when very hot, the whole were opened wide, which produced a free circulation of cool air. In short, by attending to a proper ventilation of the grand cow-house, and preserving at the same time an equal temperature, the cattle, whether for milking or fattening, were uniformly in good health, and in the finest condition. The heat was generally kept at the temperature of from 60 to 64 degrees Fahr.; and as the walls were plastered carefully, the cattle never experienced any injury from cold even in winter. It was often necessary, however, even at that season, to open some of the windows on the lee side of the house; and if more air was wanted, it was found better to open one or more windows on the windward side than to open any door. It was customary, also, especially in cold weather, before opening the doors at the end of the feeding passages, to shut all the windows, as a direct current of cold air suddenly admitted was found to be exceedingly injurious. Great care was also taken to have all the doors and windows tight, and not to admit cold air but when necessary. There were, in all, eleven doors in the cowhouse—viz., one at each end of the five longitudinal passages, measuring seven feet by three feet six inches; and one at the end of the wide passage, seven feet by six. All the passages were laid with the hardest hewn freestone; the five longitudinal ones were each five feet wide, commencing at the side walls; the transverse passage was nine feet wide near the centre of the building, there being four rows of twelve cows



each on one side, and four rows of thirteen cows each on the other. The passages were rounded two and a half inches across, which made them wear much longer, and if any liquid was spilt it ran off."

The floor on which the cows stood was raised about six inches above the passages. The front part of the stalls was composed of composition, in order that the knees of the cows might be injured as little as possible when lying down; the middle portion was flagged with hewn stone; and the part nearest the passages, about eighteen inches from the groove for the urine, was of stripped ashlar work, and with an inclination sufficient to allow the fluid to run off, the cows being thus always kept dry. The stalls were about nine feet six inches in length, and six feet four inches in breadth, and were made to contain two cows each. They were fastened by chains, in much the same fashion as in the best cowhouses of the present day, but this sensible mode of tying up animals was at the time very uncommon. The common method, and it was a barbarous one, not yet out of fashion in some districts of Scotland, was to fix the animal's neck between two stakes, so that it stood very much like a culprit in the pillory. We notice from a recent French agricultural periodical, that this practice prevails on a newly-erected Model Farm in one of the French departments. Mr Harley thus comments, and with truth, upon this old plan:—"This, to say the least of it, is exceedingly improper, for it completely prevents what is at once a natural and very necessary operation of the animal itself—viz., the licking of its skin; whereas, by the mode of fastening by a chain and swivel, the cows can at all times apply their tongue to any part of the body as easily as if they were in the fields. . . . The author," he continues, "is persuaded that it is of importance to indulge the cows in their propensity to lick with the tongue, as it contributes, like currying, to create a free perspiration, and to increase the circulation of the blood; it also tends greatly to promote the general health of the animal." The arrangements for preserving the manure were good, in so far that they admitted of perfect cleanliness being preserved in the cowhouse; and, being "preserved from wind and weather, it was considered worth from 25 to 50 per cent more than dung exposed to the atmosphere. It sold at from 5s. to 8s. per ton; the cow-water sold at from 4s. to 6s. per butt of about 400 gallons. According to the best calculation, the manure of each cow was worth, upon an average L.5 per annum."

*(To be continued.)*

# EDINBURGH VETERINARY REVIEW

AND

## Annals of Comparative Pathology.

---

### ORIGINAL COMMUNICATIONS AND CASES.

---

*Chronic Lameness of Horses, resulting from Diseased States of the Pedal and Navicular Bones.* Read before the Edinburgh Veterinary Medical Association, New Veterinary College, 24th March 1864. By Professor GAMGEE, senior.

GENTLEMEN,—I have chosen this mode of bringing before you my views on some pathological conditions of the foot of the horse, in preference to that offered by the delivery of a special lecture; because I wish to give every gentleman present the opportunity of asking questions on any point set forth in the course of my reading of this essay.

Although much of what I am about to show, on this occasion, has been repeatedly exhibited and explained by myself to most of you, and bearing in mind that some of the gentlemen whom I address this evening, contemplate shortly going before the Examining Board of the Royal College of Veterinary Surgeons, I shall endeavour to illustrate, by means of my anatomical and pathological specimens, what I am about to read, and which I have accordingly arranged for this occasion.

I hope, by the combined means now afforded, that you will all be able to carry with you such definite notions on the phenomena to be seen, and the doctrines which are to be established thereon, as will serve for good purpose in your after-career in practice.

It is perhaps unnecessary for me to revert to the fact, of my own conceptions and doctrines on the economy of the foot of the horse, and the diseases with which it is so commonly afflicted, being little in accordance with those prevailing, and recorded in the text-books in use. Nor does it form any part of my aim to show, why my professional brethren and self, originally of the same school, should, in the evening of life, arrive at exactly opposite points of the compass, on scientific and practical questions, which affect the stability and usefulness of a most essential department of the veterinary art.



Deeply sensible of some temporary inconvenience to which you are often put, when you find difficulty, nay impossibility, of reconciling my practice and teaching with what you read and hear elsewhere, I can only express thanks for the attention I have on all occasions received from you.

It is no enviable position to be placed in, to feel the necessity of differing in opinion, on matter-of-fact grounds, from contemporaries; and when, however much pains may have been taken to collect scattered knowledge, the question arises, how shall I make the matter known, and the fruit of my labour to be useful?

However demonstrable are new facts, and let the doctrines founded thereon be ever so sound, they cannot be admitted whilst the old notions occupy the ground. Indeed, it has generally been found, that the more important are new views on questions of science and art, and the more absurd and injurious those to be replaced, so much the colder the reception, or hotter the opposition, to whatever disturbs the balance of things as they are.

There are many exceptions to the rule, which teaches, that the evidence of many must be taken against that of a small minority; conversely it often happens, on most important matters, that an individual has to stand singly in mind against a body or a community, and yet if right, how effectually the tables are turned when the matter becomes seen into. I regard it to be right policy, to exercise a wise conservatism regarding innovations in doctrine, relating to and affecting our art, and few men more than myself have regretted the rashness with which ill-digested novelties have been imported into veterinary surgery during the last fifty years. Still, the fact of our having gone far in a wrong direction, does not justify our keeping in the wrong, but, on the contrary, demands all exertion to amend matters, by retracing steps and advancing on the right way.

The history of knowledge, on the diseases of the foot of the horse, submitted for consideration on this occasion, affords little for our guidance; under vague denominations we find lameness variously characterised, the real differences commonly being more of degree than of kind. Some of the old writers have gone quite as minutely into the description of the diseases of the feet of horses as those of our own time, and, in my estimation, those of three centuries past were not a whit less philosophical than the moderns; whilst it must be admitted, that in neither the early nor later times has there prevailed any systematic train of knowledge on the subject to meet the requirements, which civilisation and the increasing employment of horses has created.

In taking for my subject the most advanced diseased states, of the pedal and navicular bones, I am advisedly pursuing the opposite course to that which I usually adopt. I am drawing attention to those stages of disease and animal suffering, which commonly have so far rendered horses unfit for the purposes

to which they were adapted, that they are thereby reduced to a fractional part of their value, if sound.

This plan of exposition may be looked on as beginning at the wrong end of the subject, and is so far like reading the alphabet backwards; but it will be remembered, that we are now at an advanced period of the session, when the opposite order has been followed. Moreover, we usually find men more ready to listen to us, when describing the case of a horse rendered useless through mismanagement, than when we are trying to lay down directions on the way to keep a sound one in his normal state. People set, relatively, most value on things lost.

The first requisite towards the attainment of knowledge of diseased states, is the acquisition of a right understanding of healthy formation, and also the functions of structures, organs, and systems. In no part of the animal economy does the connection between *the science of* health and disease so blend for practical use as in the case of the foot of the horse. In making this statement, I allude to our own calling, and the special department of practice.

On searching the works of the older English writers for their views on lameness, and also amongst those of the Italians of the sixteenth century, I find much in common in their descriptions of the physical condition of horses' feet: but their description of movements when diseased are the chief incidents related which interest now. Founder and hoof-bound, are terms commonly applied to the cases of extreme lameness, and clearly these terms were used, without any definitely understood distinctions of character in the disease, such as has been drawn in modern times. Markham, in 1666, said, "The hoof-bound is nothing else but a sinking in of the whole hoof in the upper part thereof and at the heels, making the skin to stare above the hoof and to grow over the same; that the horse will halt much and his hoofs will be hot; and if you knock upon them with a hammer, they will sound like an empty bottle; and you shall understand that this disease by some farriers is called dry founder."

Gibson, in 1725, wrote "Of Foundering of the Feet. This is an excessive pain in the feet, whereby the horse, being scarcely able to touch the ground, draws himself in a heap, upon which account most people have constantly been of opinion that a horse in this condition must also be foundered in his body." But Mr Snape, in his *Anatomy*, has not only given the best account of the distemper, but has also pointed out the true method of cure. In describing the coffin-bone, he (Snape) has the following words:—"Now this distemper is so much harder to cure, by reason these fibres lie so far out of reach, most of them running on the upper side of the bone (betwixt it and the hoof) and not to its bottom, so that the hoof growing upon the sides as the sole doth at the bottom, there is great hazard; but we miss



effecting a cure if we only pull the sole out and do not cut part of the hoof off also."

This tearing off the sole, and cutting longitudinal furrows through the wall from the coronet to its bottom, with the drawing knife, was formerly a common practice, and one not yet altogether exploded.

Taplin, in his *Sporting Dictionary* of 1803, thus describes "Foot-founder:"—"A horse is said to be foot-foundered, when there is an evident defect in action, and a palpable tenderness which prevents him from putting his feet freely and boldly to the ground. It is to be observed that horses labouring under this infirmity have become gradually contracted in the hoof and proportionally narrowed at the heels, putting their feet before each other with as much fear and caution as if they were moving upon a *sheet of red-hot iron*." The foregoing quotations show that the term Founder was applied by farriers of old, to all incurable cases of lameness in the fore feet, and that those authors who lived in the last century nearest our own time, differ in no essential respects from their predecessors of two centuries earlier, either in their descriptions or treatment of the diseases.

Although farriers knew that there were different conditions and forms of feet which were the seat of permanent lameness—those with the soles flattened down, and others with the plantar region unnaturally concave—yet we do not find any clear line of difference portrayed in their descriptions. Foot-founder, chest-founder, and shoulder lameness, were terms all by turn used to express the same condition. In later times, perhaps groggy was the word most generally used to denote the cases which in our time are regarded as characteristic of the presence of navicular disease.

To the late Mr James Turner we owe all honour, as the first to point out the common occurrence of ulceration of the navicular bone, which he saw, and made known in 1816.

Before I utter a sentence, wherein my views, arrived at in later years, will appear very different to those my late lamented friend entertained; I beg to make a few statements, to show the respect which I feel is due to his memory, from every English veterinarian, and which I know is already freely accorded.

Whilst we may reasonably feel surprise,—notwithstanding our veterinary college had been established twenty-five years, and dissections of the horse carried on, besides in the meantime several ponderous volumes, descriptive of the foot having been published, with copious illustrations (said to be after nature),—that a condition so frequently present as navicular disease was afterwards shown to be, should have escaped notice down to Turner's time; so much the greater was the merit of the diligent dissector and observer, who did see the phenomenon, and published it to the world.

From the beginning to the end of his career, James Turner was one of the foremost spirits amongst his brethren, in all earnest pursuits for the promotion of good, and extending the usefulness of veterinary science ; and, in common with all members of our profession, I felt the deepest respect for his talents—personally regarding him as a friend, whom I knew over a period of thirty years, and I feel all that departed worth can excite for his loss.

I may record one incident which happened the last time we met, in May 1859, at the Royal College of Veterinary Surgeons ; when, as we sat together, and fell into discourse on the foot,—its perfect and diseased states,—I mentioned some views of my own, on the subject, as opposed to those we were both alike led to entertain in our younger days, and it was very remarkable to see the fine face of the man, sparkling with intelligence as he listened to what I was describing ; and considering that, so far as I went in my observations, I was opposing much which my friend up to the time cherished, I regard Turner's warm approval of my views as a most laudable trait in his character ; and had he been spared to the age of threescore years and ten, he would have been one of my most earnest and influential coadjutors, in trying to establish more correct knowledge of the foot of the horse, than has hitherto prevailed.

After the above digressive remarks, I shall proceed, and make such free allusions to the contributions of Turner as the interests of veterinary science seem to demand.

For my own part, I have never regarded the knowledge which Turner's discovery furnished, to go beyond the observation of some phenomena ; affording proof of conditions present, which are in themselves only incidental and consequential. Such were my notions almost from first devoting myself to the subject, about seven years after Turner's exposition had set men chuckling over the rapid march of science, and abusing the assumed ignorance of their grandfathers. The true state of the case was, that men began to think that everything had been made known about the diseases of the foot. Turner exposed ; Coleman theorised ; Sewell setoned and unnerved ; and all of them bled the poor horse most unmercifully. Thus, instead of a boon, the active discoverer had, unwittingly, been the cause of more torture being frequently inflicted on horses than was ever before seen. More cases of ulceration of the navicular bone, with all the accompanying pain and other effects, occurred in England, in my belief, in the fifteen years from 1820 to 1835, than had happened in fifty years during any earlier period recorded in the history of farriery.

The very measures adopted, in the belief of their preventing and remedying supposed conditions, became the most potent causes in producing the particular disease, and most other derangements to which the foot is liable.



In order to be able to observe facts, and turn them to use, there must be grounds for their application ; and to understand diseased conditions, those of health must be known, or acquired contemporaneously. If isolated phenomena be hastily acted on, they lead to the formation of wrong notions indefinitely ; the very thing which did happen when Turner, seeing ulcerated navicular bones, was working on the most inconsistent train of hypotheses, regarding the structure and functions of the horse's foot, that were ever entertained, since the science of anatomy was cultivated.

Contraction of the hoof has been always alleged as the precursor of navicular disease, besides an unknown quantity of bruising and concussion, to the bone and its capsule from the ground.

Looking on the late James Turner as I do, to have been the sole exponent of prevailing notions on navicular disease, since no other man has contributed anything *pro* or *con* on the subject, or, so far as I know, done more, than work after his views, and repeating the same things by differently arranged sentences, I shall confine myself mostly, for references, to Turner's book, published in 1832, by Longman and Co., London. At page 12 is stated, "I am thoroughly satisfied, that when contraction is accompanied with chronic lameness, disease exists in the navicular joint, either structural or functional, and that this complaint is neither more nor less than a *bruise* of the synovial membrane lining the joint."

Page 14,—"The truth is, that in these cases of gloggy or chronic lameness, the coffin-joint is never affected."

Speaking of the navicular bone, the author says (p. 23), "With regard to its short ligaments, it must be remembered that it is never required to descend, except in connection with the small pastern and coffin-bones, and therefore, even viewed as a process of the coffin-bone, the shortness of the ligaments is in favour of descent."

"As to the binding appearance of the expanded part of the flexor tendon, this does not in reality impede its descent, because, at the instant the navicular bone descends under the weight received from the small pastern, the fibres of the flexor perforans muscle are relaxed, and consequently the muscle and tendon are elongated."

After directing that the groom should "periodically use the stopping-box, the farrier to shorten the toe, lower the heels, and pare the sole to a nicety every three weeks," he says (page 24), "By taking all these precautions, with the continuance of gentle motion in a loose stable, the hoof will become elastic, and its elasticity be preserved, the sole and bars, not acquiring an undue thickness, will be at all times susceptible of the natural depression from the coffin and navicular bones, and will yield under the superincumbent weight."

Pages 36, 37,—“Nevertheless, these elevated coffin and navicular bones are not to be replaced in the first instance by any compulsory measures whatever; but the *treatment* should commence with the soothing system, viz., the abatement of inflammation by *abstracting blood locally until the system is affected generally*. Six quarts of blood to be drawn at one operation from an artery encircling the lower edge of the coffin-bone, the hoof having been pared as follows: the sole to be pared till small specks of blood begin to appear at every part; the bars to be entirely removed, and those channels or commissures between the bars and the frog to be excavated with a narrow drawing-knife to the quick from end to end.”

“Excision of the inside quarter of the crust” is next recommended.

“About the sixth or seventh day after the operation the shoe may be removed; and if the orifice of the bleeding place is found to be healed, and free from fester, the blood-letting is to be repeated on the opposite toe, approaching towards the outside quarter. Immediately before repetition of the bleeding is the proper time to lower the heels and shorten the toe *as much as they will bear*.

“In about a week from the second bleeding, the sole and commissures will admit another trimming.”

Again (p. 50), “The first step, and which is indispensable, consists, in bleeding from the inflamed part till the quantity abstracted locally has affected the system generally.”

I should like to be informed whether this plan of combating with local diseases of the inflammatory kind is practised in human surgery,—that of abstracting *arterial* blood locally till the heart and system generally are affected.

I find it requisite to make a few more extracts from the author where, on the physiology of the foot, he adduces the opinions of Freeman, Bracy Clark, and Coleman, besides those of himself.

Turner says (p. 93), “Mr Coleman observes, that when the laminated substances elongate the horny sole at the heels descends.” “And then,” adds Turner again, “it appears to me that, in a good, sound, unfettered foot, it descends *equally* at the toe and sides as at its heels; and that it acts as a more important spring at the front and sides under the impression of weight and force, inasmuch as it describes a larger space, and widens the base of the foot generally. According to Mr Coleman’s view, he only desires or expects the alternate expansion and contraction of the hoof posteriorly.”

“Mr Strickland Freeman,” observes Turner, “saw the elasticity of this organ more accurately; and thus expresses himself, ‘the hoof of the fore foot of the horse produces an elasticity continued from the quarters to the point of the toe.’”

I have now quoted enough, I think, to show to a sufficient ex-



tent for my purpose, the notions commonly entertained on the physiology of the foot, as well as affording some insight into the pathological doctrines in vogue.

Limit of space and time forbids me noticing the practice of shoeing in vogue hitherto, nor shall I, for the same reason, reintroduce on this occasion any detail of rules put in use by myself on this important branch of our art.

Though I have only shown a small part of what may be taken as a sample of doctrines held on the functions of the foot, enough has been said for the present purpose, and the burden of bringing up sufficient material to connect the past knowledge with the present requirement must devolve on myself.

I had almost determined to quote more at length from Strickland Freeman, to show that the sentence which my late friend brought forward with eulogy, claiming the writer's views to have been identical with his own, admits of very different construction. When, however, the tide of opinion is let loose without sufficient fixed data to regulate, there is no stopping the license until it has run its course. On some questions, in the case of James Turner *versus* Professor Coleman, we find the disciple outdoing the master, by attributing functions to the hoof, coffin-bone, and their chief connecting medium, the lamina.

Coleman held that the sole descended at the heels; Turner contended that there was descent of coffin-bone, and that, equal in extent at the point and posterior parts of the bone, and he went so far as to assert that "the expansion principle was taken on too limited a scale by Mr Coleman."

Perhaps the most concise way of showing the commonly diffused and accepted doctrines on the functions of the foot will be to relate what I said myself in answer to questions at the examining board when I was a candidate for membership.

*Question.*—What provision has nature made in the mechanism of the foot of the horse to guard against concussion?

*Answer.*—By the position and action of the splint with the cannon-bones, through the elastic nature of the connecting medium. Also by virtue of the suspensory ligament, through its elastic properties admitting the descent of the sesamoid bones, as the superincumbent weight is conveyed in an oblique direction on to them, and, further, by the elasticity of the laminae, their elongation, and the descent of the coffin-bone; when the horny sole yields and acts as a spring, the frog at the same time taking a bearing on the ground, presses open the heels and quarters, and by its upward action, the lateral cartilages are pressed open.

Having shown what my own views were on the subject under discussion in the year 1824, at the outset of my career, I will endeavour to explain the knowledge I have come to after forty years' experience.

It would perhaps not add much to our instruction, by trying to assign the exact amount of good and error which separate authors have in past times contributed, which resulted in the accumulation of a mass of hypothetical notions, amongst which were some that have proved a hindrance to the true understanding of the functions of the foot and locomotive system ever since our veterinary schools were founded.

It is enough to show what is error,—what requires amending and what replacing. There is one right view to be entertained on what is due to those who have gone before us; the writers amongst them have been our instructors; men who write faithful accounts of the current state of knowledge of their time become the guides, to some extent, of after generations. With these views, I feel it more in accordance with charitable feeling to fix the errors of the past on time and circumstances, than traceable to individual influences.

Having referred to some of the chief fallacies which have prevailed on the function of the horse's foot, which I noticed in order, from above downwards, I will exhibit my own views by the inverse mode of tracing the phenomena.

The hoof is an integral and living part of the foot; its substance of horn, varying in different parts, is endowed with density and elasticity, which fit it for co-operating with the structures with which it is in connection in all the exertions of the animal.

Each separate part of the hoof is essential to the due efficiency of the other, and if one part is weakened, for instance the sole, not only does it yield and derange all the powers in exertion, but the wall thereby is rendered unstable, and *vice versa*.

The point of the hoof, both of wall and sole, is endowed with the greatest substance in all normally conditioned feet, forms the fulcrum, and is the *point d'appui* of all resiliency, whatever be the action, speed, or burden, of the horse.

The posterior region of the foot is wholly of an elastic character; its yielding action is upwards, the order concentration under exertion, whilst the foot is pressed on the ground, this being in degree in exact ratio to the muscular energies used.

As has been stated, there is an elasticity prevailing throughout the extent of the hoof, though it is not easy to appreciate the degree at the anterior region, or point where it is least.

The laminated medium of attachment which subsists between the coffin-bone and cartilages and the wall, regulates the motion and limits the degree of it, which always goes on in the direction in which the lamina fold, which will be found to differ at the anterior and posterior regions of the foot.

The navicular bone has its functions distinct from those of the coffin-bone, in harmony with which it acts. The coffin-bone is the sustaining structure, whilst the functions of the navicular are those of constituting a fulcrum and a pulley on which the flexor



pedis tendon acts; and its next special function is of a twofold kind, it forms a powerful lever, or perhaps more correctly an *appui*, on which the pastern bone acts by means of two powerful ligaments, which are attached to the anterior part of the lower head of that bone; in all action of the horse the navicular bone has its twofold concerted function, that with the large tendon behind, and with the long pastern bone as an uplifting shaft. The navicular bone is the effective fulcrum in revolving the foot and turning the bearing forward to be expended through the coffin-bone and hoof anteriorly.

I have exhibited often, and also shown in published papers, that the yielding posterior region of the foot is made up, besides the cartilages and the hoof, of bands of ligamentous fibres, which take direction from the cartilages to which they attach, and concentrate towards the centre and bottom of the coffin-bone. Some of the largest and more readily seen of these ligaments are attached to the upper margin of the lateral cartilages, others run from the inner surface, and these co-operate with the strong bands of the frog, and the whole act inwardly as the foot is borne on, or when in any way exerted on the ground.

These ligaments hold in the lateral cartilages, in a way similar to that of the sail of a ship or boat, in different points by its cords, and they may be regarded as the stanchion bands.

One other of my contributions to the Physiology of the Foot, and which is most important to be rightly understood, relates in a twofold way to what has been called the suspensory ligament, which is called highly elastic. I have proved that its texture is the opposite of elastic, and that its functions are not of a suspensory character. On the contrary, I have shown the ligament to form a backstay in both the fore and hind limbs of the horse.

I shall not dwell on many of the lesser, though important, phenomena in the foot, but confine myself to the notice of those governing principal parts, without understanding of which it would be of little avail to speak about its diseases, or of the different action to be observed in horses when in various ways deviating from the sound state.

One inevitable result which will follow the prosecution of inquiry into the views I am placing before the profession, will be the leading to understand that the foot of the horse is a structure of strength, and any deviation unfits it for the normal amount of exertion it is destined to undergo. For example, when you know that the sole supports the weight, and that if the wall is weakened or made to bulge by softening, the floor, losing its support and sustaining co-operating structure, gives way or collapses, thus you will at once see that we must not do what has been done—deprive the foot of its substance, density, and, alas! its strength.

It may be thought by some that, in coupling under one head for consideration such apparently opposite pathological characters,

as those of puniced foot and navicular disease, I am exposing too vast a field, and making the whole still difficult to understand.

For my own part, I think I shall show more of what I find to be the causes, character, and progress of diseases of the feet of horses, by pointing out the connection and order of sequence in which they happen, than could be done by dwelling on the description of a phenomenon (or what is called a disease).

Navicular bone, or joint disease, never occurs as a single and primary disorder, but follows as a constituent character in advanced stages of more extended diseases of the foot.

In all cases where ulceration of the navicular bone is found, the coffin-bone has been the primary structure affected. And in expressing my views thus broadly, I need only remark on the possible cases of injury which, by pointed weapons alone, can accidentally penetrate into the under surface, and state that such occurrences so rarely happen, that they may almost be excluded from the catalogue of causes. So little is the navicular bone and its joint capsule exposed to violence, that I have only seen two cases (in both of which the life of the horses was sacrificed) during my lengthened career. And as to bruises, which writers allege to be common, these are impossible, to convince any practical man of which, I need only advert to the fact, that navicular disease is found almost exclusively where the sole of the foot is unusually arched above and concave below; while in the horse with flattened down feet, in which the point of the frog, the centre of the coffin-bone, and the whole of the navicular bone are brought unnaturally near to the ground, yet these are just the cases of deformed feet, in which the navicular bone and joint are found free from ulceration. The fact of this immunity from navicular bone disease, in feet which have suffered from peculiar deformities of coffin-bone, hoof, and some other structures, may afford instruction to others as observance of the phenomena have to myself. There is little stress on the navicular bone in flat feet; the pressure from behind cannot be exerted, because the sole and bone are not in a position to be acted on, hence such animal is deprived of speed and half his power.

These statements are not made on the assumed diseased condition of feet; truly many horses were only seen whilst they were alive, but extensive post-mortem researches have been conducted by myself, over years of time, with much opportunity, and, which was most essential of all, with a sensibility of the importance of the subject.

Farriers of old, mention coffin-joint disease very commonly; but when the ulcerated condition of the navicular bone was discovered, all notions of disease in the anterior region of the foot were dismissed. Turner says, page 14,—“The truth is, that in those cases of groggy or chronic foot lameness the coffin-joint is



never affected." And in the margin of the same page is noted—"Coffin-joint lameness, error of the ancient writers respecting it." Here we have the great mistake—that of attaching undue importance to the one condition newly observed, and repudiating knowledge which had prevailed for ages, which, though without pretension to exactness, was based on observation and light which had come down traditionally from indefinite periods.

We have only now to substitute coffin-bone for coffin-joint disease, and the ancient phrase may be reintroduced in a manifold greater number of cases than have been heretofore known; and though coffin-joint affection is not common, exceptional cases are met with sufficiently often to render record of them necessary.

The causes of navicular disease must now occupy attention. This part of the subject forms the most important in our inquiry.

Cause in these cases we regard as of two kinds: predisposing and exciting. We are enabled to say that such a horse is liable to navicular disease; and turning to another, prognosticate that he may become lame from a very different physical condition of his feet; and looking at a third, pronounce him perfect, a horse for wear, predisposed to no disease, but not exempt from any.

It is the narrow formed light horse, mostly used for fast work, which is liable in time to become the victim of navicular disease, and the heavier animal used for draught work to other characters of disease, of which flat or convex soles form accompaniments; and even when such horses are submitted to the same management as regards the skill used in shoeing them, and in time both become lame, the feet of each will have changed in opposite directions; the horse's feet which were concave will have become more so, and the one that had flat soles will exhibit convexities over the same.

These supposed cases had at first their predispositions, causes were added, and the effects followed. But if, instead of the horses being exposed to mutilation of hoof, softening, and in every way weakening that structure, and the applying of ill-adapted shoes, all these conditions change for better, the horses would to a great extent have recovered from their early defective states.

It is stated in books on the subject, and especially in that of my late friend so often quoted, that rest is a potent cause of navicular disease; that horses which are at work few hours in the day, and consequently are many hours in the stable, are those amongst which the disease prevails, whilst in agricultural and draught horses generally it is seldom found. It has been farther said, that low straight action predisposes, whilst horses which lift their feet high when going are little liable to this affection.

All the above will serve our purpose and help to explain the truth.

I am going to demonstrate and show, that instead of the ulceration of the navicular bone being due to rest, it arises altogether in consequence of excessive exertion.

The two horses we have been contemplating exerted their powers chiefly on different parts of the foot, owing partly to their construction, but more to the paces they respectively have worked at; the pressure is intense, and rapidly repeated, in the horse of fast movements, in the gallop in particular; the navicular bone is acted on less, and more deliberately, in heavier draught horses.

In both cases, the whole foot is rendered unstable by any weakening effects produced on the hoof which deprive the coffin-bone of support. In the case of the heavier animal, Nature's laws (always adapting to circumstances) are put in force, and absorption of the coffin-bone is set up, mostly around its lower and outer margin anteriorly; the sharp outline of the coffin-bone, so essential to its perfect economy, becomes intolerable when the hoof is reduced, and the iron shoe, void of any regular adaptation to the plantar region of the foot, offends; hence Nature hurries her agencies to remove parts.

The coffin-bone of the lighter and speedy horse undergoes changes in a different way; in his case the bone also wastes, but as its original concavity is increased, in this, like in the former, the sole is rendered too weak to sustain its share in the economy of the foot, which then takes on the form to which originally it was disposed, and in this case collapses; its upward arch is increased, that it may the better sustain the more energetic pressure exerted on it in fast action; the muscles simultaneously limit the flexion of the limb, and by the position given to the shank and pastern bones, the passive ligaments tend to fix the lower bones of the foot. In this case, the pressure on the navicular bone is very great and constant. The large strong ligament gives evidence of its intense action, by its thickened, hard feel, just under the knee; whilst, blended with the perforens tendon, the combined structure is acting with concentrated energy in keeping up the navicular bone. Under this constant abnormal pressure, this bone, like the coffin-bone, wastes. Whether a state of atrophy which either or both bones assume is due wholly to absorption, or how much is due to impaired circulation and nutrition, I am not prepared to state; but it results that the wasting of the navicular bone proceeds from its internal centre and not from its surface, preceded by diseases of the capsular membrane and altered synovial secretion as is supposed. As the centre of the bone wastes, its posterior surface flattens and becomes irregular, till at length a breach in it occurs, similar to what takes place in a decaying tooth.

I shall now dwell on the rules I follow in the treatment of cases of lameness in which the navicular joint is in an unascertained degree implicated. Gentlemen whom I am addressing have seen



the modes of proceeding which I have systematised, and which are carried out at the infirmary and forge of this College.

As our practice is simple (not easy to master in its detail and application, altogether different things), I shall not dwell long on this part, and may therefore begin by showing what I omit to do, which others have done and continue to do. The excluding part will call for more than the few things which my catalogue of appliances includes. In none of the cases of foot lameness contemplated in this paper do I ever bleed the horse, either locally or generally; never apply setons; never divide the nerves, thereby making the horse exert structures too much diseased to admit of being freely used. I never apply leather or any other soles, but seek to develope and utilize the natural soles of the animal. Apply no dung, cow's or other, to the feet, nor yet clay or wet in any form, and have not applied a bar-shoe for years past.

Our own treatment consists, in the first place, of removal, as far as possible, of all causes, viz., shoes, and by placing the feet in the best condition as to form and standing, having regard to their state, more or less, of pain; a smooth stone floor, lightly littered over, and kept clean and dry is desirable. In cases where acute pain in the feet prevails, we apply fomentations of warm water, keeping each foot in it for about fifteen minutes, twice or thrice daily. We limit the time, because excessive softening of the hoof should be avoided, and all the soothing effects derivable are attained, and the functions of the foot find their balance under this emollient treatment, which is seldom required to be kept up beyond the first two or three days; after which we rub the hoof, previously made clean and dry with an ointment, place the horse in a loose box, and at the expiration of from one to three weeks, shoe him, and in most cases attain at once a good result. Horses that have been a long time lame often being restored to perfect soundness; whilst others, improved in various degrees, go on, when the functions of their feet are restored, gradually improving. The system of shoeing pursued, it will be observed, is the main agency by which success is attained, and the only one by which it can be maintained.

It will be said by some, that the cases noticed above are not those of navicular disease at all, which is equivalent to saying that affections of the navicular joint do not succumb to treatment; and I shall not lay much stress on that point, though I have been able to trace some such cases to their end. One, in particular, of a mare which had been lame for years, and became free from lameness through shoeing alone, working excessively all the while in a cab in Edinburgh; and three years afterwards, when the mare was destroyed through having met with an accident, I obtained her feet, and exposed the ulcerated navicular bones functionally restored, showing that the tendon had played on them.

In treating on the next pathological condition of the foot, set down for this discussion, I must be more brief.

Founder, or, as our modern nomenclature gives it, Laminitis, is the name applied to a diseased condition of the anterior region of the foot, the seat of which, however, is essentially the coffin-bone.

Inflammation of the laminae was the term used in my early time, which was meant to convey the new idea of the lamina being the seat of the disease ; and the second name, quoted above, is meant to show the same thing.

If the last diseased condition of the foot has been little understood, on that which we are now about to speak there has been an indefinite misunderstanding. The symptoms of these acutely painful cases are very characteristic, and fairly recognised by practitioners. But there are few conditions from which lameness in the feet of horses arises, which have such a variety of degrees as the one we are considering.

When we look on the foot in its chronic stage of the affection, we find the hoof altered in form, indicating a relative alteration of the coffin-bone, due to protracted absorption. And this state only represents a series of affections more or less rapidly succeeding, amongst which are commonly corns, some of the true pathological specimens of which I exhibited for the first time five years ago. If we go to a case of acute founder, to which these new terms are mostly applied, we find all the symptoms of local irritation and inflammation to an intense degree. Symptomatic fever prevails, and the horse, unable to support himself on one foot, two, or occasionally all four, feet become affected, the animal is prostrate, and sometimes sinks, at others becomes useless, and seldom rallies to recovery.

The plantar region of the foot is the seat of the affection in these cases ; and in thousands of the less urgent cases, where lameness is variously manifested, it is at the bottom of the coffin-bone, in it and its membranes, where the seat of pain is. And in the extremely severe cases, where the sole bulges, and a soft fluctuating impression is imparted to the pressure of the thumb, lymph is exuded, and active ulceration is going on, the coffin-bone is being flattened and shortened, and its acute margins are being cut off to accommodate it to the thin, flattened sole.

We are told of inflammation of the laminae, and their consequent separation ; such notions are merely ideal. All the derangements found in the laminated structures and the coffin-bone anteriorly, I find to be consequential, the whole region of the foot, nay, every component part of the foot, becoming disordered, either in structure or function, by the first great changes.

Suppuration rarely occurs in the feet in these cases. Our object must be to prevent such states as those of the extreme nature represented.



The worst amongst those cases saved from utter destruction are ever after difficult to manage in shoeing. The superincumbent weight is borne mostly on the posterior region of the foot, to which end care should be taken not to oppose by applying a thick-heeled shoe, because these horses consume the iron there; but we should accommodate the shoe to the way the horse moves. Horses in this state, even in the slighter cases, seldom regain their former speed.

I have many specimens to show, and the history of cases to relate, demonstrative of other and special diseased states of the coffin-bone, some of which are more of a constitutional character, and belong to the same class as pathological phenomena occasionally met with in other bones of the skeleton of the horse, in which the constituent elements differ in relative proportions from those contained in normally healthy bone. And these conditions seem sufficient to explain some otherwise obscure cases. With reference to the causes of fractures, ulcerations, and lacerations of tendons from their insertions, &c., some further observations on these I shall reserve for an early lecture.

It would exceed the limit of this paper to attempt a detailed account of the treatment necessary in these cases. The same absence of violent measures we prescribed in the first case, and the same care and bland measures to be adopted, are those from which our success in their treatment is derived. It is very strange to reflect, that men should so persistently have shut their eyes to the liability of horses to injuries and diseased conditions through exertion at the same parts of the foot as other animals are, viz., at the lower surface. And just alike do cases happen, and though the efforts are not much observable in the membranous sole, they are very marked and very common in all the lower surface of the coffin-bone, the form of which is altered from the normal state far more than that of any other bone in the skeleton of the horse. And all such changes, however gradually brought on by injury, have been the causes of pain, and always impair the horse's action, speed, and power.

Should the statements made in the foregoing pages have the effect of eliciting discussion on the subjects, and lead to a more earnest cultivation of the important branch of knowledge involved, my object in writing this paper will have been fully accomplished.

---

*Ruminotomy.* By JAMES BAILLIE, M.R.C.V.S., Lauder.

ON 12th September 1863, I was called to visit a bullock, the property of Mr Hogarth, farmer, Shielfield, and which had been grazing in a "let park" at some distance from the farm, but was

sent home on its being noticed that he was not feeding. He had passed no fæces for a considerable time.

On examining the animal I recognised impaction of the rumen, and at once administered mag. sulph. ℥j; ol. crotonis, gutt. xij; ammon. carb. ℥iv., following this up by frequent enemas and active hand-rubbing of the left side of the abdomen.

On the 13th, the rumen was very tympanitic. This I relieved by the use of the trocar and cannula, allowing the latter to remain in the stomach to obviate any similar tendency for the future. No passage having been obtained, I gave mag. sulph. ℥j; ol. crotonis, gutt. xxv.; ammon. carb. ℥jv., and prescribed a continuation of the enemas.

On the 14th there was no improvement. Ol. crotonis gutt. xx. was now given in linseed oil; the treatment otherwise to continue as before. The patient having eaten nothing during his illness was now becoming very weak, and I proposed to open the rumen and take out its contents, in the event of there being no amendment by the following day.

I was later in calling on the 15th than I expected, and in the interval the owner, despairing of success, had sent for a person to kill the animal, who was just about to proceed with his work when I arrived. I of course offered to operate, when Mr Hogarth laughingly said, "Very well; but if you had just been a few moments longer there would have been no need."

After obtaining an ample supply of water, a sponge, and a couple of towels, I had the patient taken to a stake at the end of the building, placed one person at its head and another behind to keep it against the wall. I then withdrew the cannula, which had not hitherto been removed, and introducing a straight bistoury into the wound caused by the latter at a point equidistant from the last rib, the anterior spine of the ilium and the lumbar transverse processes, cut in a downward direction until the wound was sufficiently large to admit my hand easily. I next introduced a towel, to prevent anything from passing into the peritoneal sac, and proceeded to take out the greater part of the contents of the rumen and reticulum. Having taken out about two pailfulls, which I thought sufficient, I carefully removed the towel, cleansed the lips of the wounds, and closed the lips of that in the rumen by three interrupted silk sutures, endeavouring to bring the peritoneal coats as much as possible into apposition. I now passed some strong metallic sutures through the wound of the abdominal parietes. I intended to have used the quilled suture, but chose the interrupted, on account of its simplicity, and because I thought it would answer the present case sufficiently.

I then hung cloths over the loins, allowing them to hang over the wound, and had them kept constantly wet. Tinct. aconit. gutt. xx were given, and two doses left to be administered.



On the 16th the bowels were still unmoved, and mag. sulph. ℥j. ol. crotonis, gutt. xxv. were given, followed up by enemas as before. The following day I found the bowels acting gently, and the patient much relieved and eating turnips. Boiled meat and oilcake were refused, so I restricted the diet to a few turnips daily.

The gases evolved from the turnips prevented the wound from healing by the first intention, and it was accordingly dressed with digestive ointment. The part in which the cannula had remained so long still healed tardily, so I applied a small blister of cantharides round the wound, taking care that it should not come in contact with the raw edges, after which the work of cicatrization went on rapidly.

I may state that I saw Mr Hogarth lately, and he told me the bullock was feeding as well as any other he had tied up, and that he hoped to sell it fat in a very short time.

---

*Inversion of the Uterus of a Mare.* By C. H. HURRELL, M.R.C.V.S.,  
Southminster, Essex.

*February 6th 1864.*—This morning we were summoned to attend a six-year-old cart mare, the property of Mr J. R., which was supposed to be about to “slip her foal.” On arriving, found her very full of pain, lying in an open yard, breathing quickly, dripping with perspiration, and a total inversion of the uterus. She had foaled before the man had sent, he in his hurry overlooking the foal, as it was dark.

When the mare was made to rise, the uterus reached considerably below her hocks. It was much discoloured, and quite cold, as there was a sharp frost that morning. Part of the placenta was gone, and as much of the remainder removed as possible. The parts were then thoroughly cleansed with tepid water, as some short straws had adhered to them. Two men were placed behind her with a broad piece of canvas, on which the uterus was kept resting. The process of returning was then commenced, and by a great deal of perseverance, and a great deal of labour, it was successfully accomplished. The hand was kept on the parts internally for a short time, until they began to assume their natural heat. Three sutures of broad tape were then introduced through the labii, and the mare moved to a place where she could remain quietly. The litter was so arranged that she stood about 18 inches lower in front than behind, thus causing the uterus to keep its place, in some measure, by gravity. Her head was now secured, so that she could not shift her position much, or lie down. An opiate was given, and she was not seen again until the evening. She had by this time become dry and

comfortable, and all straining had ceased. Pulse about seventy. Gave some fever and aperient medicine, and allowed her bran mash, a small quantity of grass, hay, and flour gruel, of which she partook moderately,

*Saturday 7th.*—General appearances much the same; pulse unaltered. Gave some fever medicine, with moderate doses of Belladonna ext., her bowels acting well. This treatment was continued for a few days, until the pulse was reduced, and the mare apparently improving. The sutures were removed—one every day—and the slight swelling they had caused soon subsided. She was then allowed her liberty, being kept in a loose place. Corn was given sparingly, and bran in good quantity. Gentle fever and aperient medicine, followed by tonics, were administered, and she gradually improved, until every symptom of her formidable misfortune disappeared; and up to the time I now write she has remained perfectly well, and I believe has been to her usual (farm) work for some time.

---

*Amputation of the Penis in a Pony.* By CHARLES DAYAS,  
M.R.C.V.S., Longnor, Shropshire.

IN May last I was requested by a clergyman in my neighbourhood to examine a brown pony eight or nine years old, and about thirteen hands and a-half high, with reference to an excrescence of a warty nature upon his penis, which caused the animal much inconvenience, and as it was almost constantly bleeding, it was a source of considerable annoyance to his owner. Having drawn the penis from the sheath, and satisfied myself as to the nature of the morbid growth, I advised its excision, at the same time giving an opinion, that it would in all probability ultimately be found necessary to amputate the organ. In a few days after this examination (the pony having in the meantime had a dose of physic), I proceeded to operate, which was a work of not much difficulty, as the operation was simply an excision of the diseased portion. There was no subsequent bleeding, and he went on as usual with his work, and for a time there was no appearance of a renewal of the disease. My attention was not called to the pony again until October, when I found that the symptoms were the same as when my attention was first directed to the case, the morbid growth was of about the same size as that which I had previously removed. Excision was again had recourse to, with the same result as before; but with this difference, the morbid excrescence now grew again, and very rapidly increased in size; so much so, that on the 1st of January—only six weeks after the second excision—it was double the size it had ever previously been, involving the whole of the glans penis, and partially plug-



ging the urethral orifice ; the pony was of course unable to protrude the penis from the sheath, and the fetor was intolerable. I now determined to amputate the penis ; a dose of physic was accordingly administered, and the pony kept upon bran mash till the 6th of January, on which day—being kindly assisted by Mr W. E. Litt—I proceeded to operate as follows:—The pony being thrown on the right side, the near hind leg was taken from the hobble, drawn forward to the shoulder, and secured ; we then passed a catheter into the bladder, and withdrew a small quantity of urine. After this (the catheter being left in the urethra) a ligature was tied tightly round the organ, above the part where it was intended to commence the incision ; and for the purpose of convenience, another ligature was passed round below. I commenced the incision between these ligatures, and at the lateral part of the dorsum of the penis, and carefully proceeded till I divided the chief artery, which is a vessel of considerable size. This was taken up and tied by Mr Litt. I next cut down upon the corresponding artery on the other side, and this, also, was secured ; after which the incision was continued in a slanting direction forward, so as to leave the urethra a little longer than the other divided portion. When the urethra was reached, the catheter was withdrawn, and the division completed. The pony was now allowed to rise. With the first flow of urine a large clot of blood was washed from the sheath, but the pony rapidly recovered ; and an examination, on the 25th of February, showed the part to be perfectly healed, and no symptom of the disease again appearing. I may remark, that he urinates without difficulty, and is now at work as usual. The diseased portion removed was of an irregular ovoid form, and, with the glans penis, weighed half-a-pound. I have not had an opportunity of examining it under the microscope, but it seemed to differ in no general particulars from an ordinary wart.

---

*The Lancashire Veterinary Medical Association ; and on Inoculation of Cattle, with the view of Pleuro-pneumonia.* By W. A. CARTWRIGHT, M.R.C.V.S., Whitchurch, Salop.

ON Wednesday evening, the 9th of March 1864, I had very great pleasure in attending the first meeting, after its formation, of "The Lancashire Veterinary Medical Association," which was held at the Brunswick Hotel, Manchester, at 7 o'clock.

*President*—MR THOMAS GREAVES.

*Vice-Presidents*—MR WM. HAYCOCK, MR A. L. GIBSON, MR CHALLINOR.

*Hon. Secretary*—MR THOMAS TAYLOR.

*Treasurer*—MR ROGER HAMPSON. All of Manchester.

The Inaugural Address was delivered by the President ; and,

after several letters being read, Mr Haycock read an essay on *Pleuro-Pneumonia*. The meeting was a most respectable one, and numbered between thirty and forty, some of whom, like myself, had received kind invitations to be present, and had come from a distance. The time for discussion was but short, but many valuable observations were made by the President; the essayist, Mr Naylor of Wakefield; Mr Taylor and Mr Lawson of Manchester; Mr Carter of Bradford; and Mr Leech of Bakewell, and others whom I had not the pleasure of knowing. There was also a deputation from the "Leeds Veterinary Medical Association." The subject was postponed to their next meeting in June. I must say it was one of the pleasantest meetings I ever was at, and augurs well for the future, as there was no *hauteur* or overbearing spirit shown by any one, but, on the contrary, all was love and harmony.

At the meeting, among other things, I casually alluded to inoculation; and I have now thought proper to send the following paper to your "Review," thinking it may, perhaps, catch the eye of some of those then present. My mind is not fully made up on the subject of inoculation; but still I think we must not discard it, as there are many facts related in its favour. The subject wants to be thoroughly tested by all of us, as pleuro-pneumonia has been making sad havoc throughout the whole world. I would strongly recommend noblemen and others, who can well afford it, to employ *veterinary surgeons* to test its efficacy, for, if a preventive, it would be conferring one of the greatest boons on farmers and others.

---

On the 25th February 1863, I was requested by the Malpas Cattle Insurance Club, to go over to Mr Sandback's of Grafton Hall, near Gilstone, Cheshire (ten miles off), to examine the lungs of some cows that had died, in consequence of being inoculated with the viris of pleuro-pneumonia. On my arrival I ascertained that on the 3d January 1863 a Mr Garside of Tattenhall had inoculated ten of his cows, at about half-way down the back part of the tail, all of which had taken effect; and on my examination, I found that they had taken good ways, and the wounds in the tails were most of them healed up, and only some two or three of the tails had sloughed off.

In consequence of these having done so well, the same person inoculated, on the 17th of January 1863, some forty-five more in the same way. On examining these, I was told that one of them had died from inoculation, and was buried. An attempt was made to get the lungs up for me to see, but only a small portion could be dug up, as the grave was very wet, and soon filled with water; but that portion which I saw had no trace of pleuro-pneumonia in it.



I also examined the lungs of another cow that was in a slaughter-house a little distance off, that had been killed in consequence of being nearly dead from having been inoculated. Her tail about the vagina, rectum, and rump, had been enormously swollen. The lungs *were perfectly sound*, and the pleura pulmonalis et costalis were equally so, there not being the least effusion or adhesion between them.

In the cow-house there was another very fine cow, in good condition, lying all at full length, breathing a little short, and apparently suffering very much from inoculation, as her tail and all about the vulva, rectum, and rump, were enormously swollen. As I saw no hopes of her recovery, I ordered her to be slaughtered. It was thought she would have to be dragged on a gate to the barn to be slaughtered, but she got up and walked well, and looked quite cocket, so much so that it made us hesitate destroying her; but as the swelling was so great on her rump and other parts, I could not hold out any hopes of her recovery, consequently she was slaughtered.

*Examination.*—Immediately after being skinned I opened her, and found that *her lungs were in perfect health*, and not showing the least vestige of adhesion or inflammation in the pleuræ surrounding them. Of course, all about the rump was one mass of dense effusion of lymph and serum, of a similar nature to that found in the lungs of those that have died of pleuro-pneumonia; for, on cutting into the parts, it had that streaky appearance as is to be seen in diseased lungs. The effusion also extended all around the rectum and vagina, and all along on the inside to the kidneys. The stomachs seemed natural, but as I was in a hurry, I did not examine the viscera minutely; but I could not see anything wrong of any importance in any other part.

Many of the other cows were pretty well again, but some were still labouring under serious disease in the tail, and some few were slightly so about the rectum, vulva, and rump; and with the exception of some two or three, I was inclined to think they would get well. Many of the tails had sloughed off, and others were swollen a good deal, and ulcerated in various places, and of an unhealthy character.

One of these, which had very great disease of the tail, and about the vagina, rectum, and rump, was lying along at full length, and straining very much, and, to all appearance, wanted to calve; and I believe the “water bag” made its appearance. A farrier was there, and he and others got the calf away. After its removal, I told them I did not see the least hope of her recovery, and the night but one after she died.

The lungs were sent over for me to examine, but I could not detect the least symptom of pleuro-pneumonia in them.

25th March 1863.—I went over this day to see the stock, and found them all going on very well. None had died since I was

over, and the greater part of them looked extremely well, improving in condition, good in their coat, and feeding well, and the remainder progressing favourably.

On counting all the cows that were tied up, I ascertained that there were sixty-eight, but thirteen had been brought from some building at a distance, and had not been inoculated, but it was thought they would be safe, as the others had been inoculated; consequently, out of the sixty-eight, only fifty-five had been inoculated.

Out of the first ten that were inoculated (three weeks before the others) two lost half of their tails, and out of the remaining forty-five twenty-four had lost half of their tails. The tails now were not above two feet long. Consequently five died out of the forty-five from inoculation, and I am informed that twelve died prior to inoculation.

Up to this time (25th March 1863) none of those that had not been inoculated, and put amongst those that had been inoculated, or those that had been inoculated, have been affected with pleuro-pneumonia. Nearly all the tails, with a few exceptions, are healed up, but some four of those that are well, and of full length, are a little contorted, as if the joints had been severely diseased, and the bones had now grown crookedly together.

15th April 1863.—I this day saw Mr I., who said the cows were going on very well, and that he had not had any more deaths, but that two of the cows that had been inoculated had calved, and to all appearance the calves died from pleuro-pneumonia.

I believe some two or three of those *that had not been inoculated* have died of pleuro-pneumonia since, *but not one of those, up to the present time, that had been inoculated, have done so.*

#### INOCULATION OF MR NUNNERLEY'S STOCKS.

##### 1. *At Bradeley Green, near Whitchurch.*

Mr Nunnerley, who resides at the "Farm," near Whitchurch, and who occupies a farm of some 250 acres there, has informed me that, prior to inoculating his stock at another farm of his, at Bradeley Green, he had lost by pleuro-pneumonia eleven cows, two or three rearing calves, and two or three sucking calves (about a month old). The first cow died about the 14th February 1863, and the others between that time and the May following.

On the 1st May 1863 a farrier, residing near Whitchurch, inoculated thirty-seven cows, ten yearling calves, one three-year-old bull, and two yearling bulls. Of these, two cows, the three-year-old bull, and one of the rearing calves, died from the effects of inoculation. They began to swell up the tail to the rump at about nine or ten days to a fortnight, and died before the expiration of a month, after having been inoculated. Two of the cases



appeared to have a slight attack of pleuro-pneumonia, at about three weeks or a month after having been inoculated, but they got well.

## 2. *Stock at Buereton.*

At this farm of his, and which is attended to principally by his eldest son, he had lost, or sold off, three or four cows that had pleuro-pneumonia. About the last week in May, or the beginning of June 1863, his son inoculated, on the inside of the tail, by applying a small portion of diseased lung, and tying it on the wound with a little hair around the tail, sixty-five cows, two-year-old bulls, and seventeen two-year-old heifers.

He lost of these, by inoculation, about one cow and one of the two-year-old heifers, and some of the tails came off. In about a month after having been inoculated, his son inoculated thirty or forty of the cows again, as the inoculation had not produced much apparent effect in swelling the tails. About this time the weather was very hot, and three or four of the cows died from the last inoculation. When they were inoculated the last time all the cows but one had calved, and this one died from the effects of inoculation, and the disease extended to the udder, under the belly, and to the rump. None of this stock, up to the present time, have had any attack of pleuro-pneumonia since being inoculated.

## *The British Pharmacopœia.*

(Continued from last Number.)

*Nomenclature.*—Chemical compounds of uncertain composition, or the name of which has been repeatedly altered, are designated by names which imply no theory as to their constitution. *Bismuthum album* is, for instance, the name given to the medicinal nitrate of bismuth, about the true constitution of which there are many opinions. *Calomel* (calomelas) is the name given to the lower chloride of mercury, whilst the higher is called *Hydrargyrum corrosivum sublimatum*, thus avoiding the dangerous errors which might arise by the use of the more strictly chemical terms. At the present time calomel is looked upon as a subchloride of mercury ( $\text{Hg}_2\text{Cl}$ ), and corrosive sublimate as the protochloride  $\text{HgCl}$ ; whilst formerly the first was considered a protochloride, and the latter a bichloride ( $\text{HgCl}_2$ ). Were scientific names in such cases to be introduced into the Pharmacopœia, we can easily see how mistakes might arise; a physician whose peculiar chemical views led him to prescribe calomel as the protochloride of mercury, might have corrosive sublimate dispensed by the apothecary's assistant, whose knowledge of the nomenclature of modern chemistry exceeded his common sense.

Instead of Chlorinium and Iodinium, the new Pharmacopœia adopts the names Chlorum and Iodum, and we have accordingly a Tinctura iodi, a Liquor chlori.

Nouns ending in *as* are in the Pharmacopœia made feminine instead of neuter, so Ferri sulphas *granulatum* is now Ferri sulphas *granulata*.

The word *sulphuretum* (sulphide or sulphuret) is now changed to *sulphuratum*; it is considered as an adjective, and is made to agree in number, gender, and case with the noun to which it is attached.

OLD NAME.	NEW NAME.
Antimonii sulphuretum aureum (Ph. Edin.)	Antimonium sulphura um.
Potassii sulphuretum.	Potassa sulphurata.

Other changes in nomenclature will be seen by a reference to the following table, which we extract from an admirable analysis of the British Pharmacopœia, which appeared in the February number of the Edinburgh Medical Journal:—

RECENT NAME.	PRESENT NAME.
Acidum muriaticum .....	Acidum hydrochloricum.
nitro-muriaticum (D.) .....	nitro-hydrochloricum dilutum.
Aconitina .....	Aconitia.
Æther sulphuricus .....	Æther.
Ammoniæ sesquicarbonas .....	Ammoniæ carbonas.
Antimonii sulphuretum.....	Antimonium sulphuratum.
potassio-tartras	tartaratum.
Arsenicum album.....	Acidum arseniosum.
Axungia .....	Adeps præparatus.
Balsamum Canadense .....	Terebinthina Canadensis.
Bismuthi nitras (L.).....	Bismuthum album.
Calx chlorinata.....	Calx chlorata.
Chiretta.....	Chirata.
Chlorinium .....	Chlorum.
Chloroformyl.....	Chloroformum.
Confectio Amygdalæ .....	Pulvis Amygdalæ compositus.
aromatica.....	Cretæ aromaticus.
Emplastrum Plumbi .....	Emplastrum Lithargyri.
Enema foetidum .....	Enema Assafoetidæ.
catharticum .....	Magnesiæ sulphatis.
Ferri ammonio-citras .....	Ferri et Ammoniæ citras.
oxidum nigrum .....	oxidum magneticum.
potassio-tartras.....	Ferrum tartaratum.
pulvis .....	redactum.
Glycerina .....	Glycerinum.
Hydrargyri ammonio-chloridum.....	Hydrargyrum ammoniatum.
bichloridum .....	Hydrargyri sublinatum corrosivum.
chloridum.....	Calomel.
biniodidum .....	Hydrargyri iodidum rubrum.
iodidum .....	viride.
nitrico-oxidum.....	oxidum rubrum.
Infusum Buchu.....	Infusum Bucco.
Cinchonæ spissatum (L.).....	Extractum Cinchonæ flavæ liquidum.
Rosæ compositum .....	Infusum Rosæ acidum.
Sennæ compositum .....	Sennæ.



Iodinium.....	Iodum.
Liquor Calcis chlorinatæ .....	Liquor Calcis chloratæ.
Chlorinii .....	Chlori.
Plumbi diacetatis .....	Plumbi subacetatis.
Sodæ chlorinatæ.....	Sodæ chloratæ.
Magnesiae carbonas ponderosum (D.)...	Magnesiae carbonas.
Mistura Acaciæ.....	Mucilago Acaciæ.
Camphoræ .....	Aqua Camphoræ.
Morphiæ murias .....	Morphiæ hydrochloras.
Oleum Terebinthinæ purificatum .....	Oleum terebinthinæ.
Oxymel .....	Mel Aceti.
Pilula Saponis composita .....	Pilula Opii.
Plumbi oxidum.....	Lithargyrum.
Potassæ bitartras .....	Potassæ tartras acida.
hydras.....	Potassa caustica.
Potassii sulphuretum .....	sulphurata.
Pulvis Cretæ compositus .....	Pulvis Cretæ aromaticus.
Ipecacuanha compositus .....	Ipecacuanhæ cum Opio.
Kino compositus .....	Kino cum Opio.
Quina .....	Quinia.
Quinæ disulphas .....	Quiniæ sulphas.
Sacchari Fæx .....	Theriaca.
Sodæ biboras .....	Borax.
Spiritus Ætheris nitrici .....	Spiritus Ætheris nitrosi.
Tinctura Ferri sesquichloridi .....	} Tinctura Ferri perchloridi.
muriatis .. .....	
Iodinii .....	} Tinctura Iodi.
comp .....	
Opii camphorata (E. D.).. ..	} Tinctura Camphoræ cum Opio.
Camphoræ composita (L.) ..	
Unguentum citrinum .....	Unguentum Hydrargyri nitratis.
Vinum Antimonii potassio-tartratis ...	Vinum antimoniale.

One of the most important duties of the Pharmacopœia Committee was to expunge all those articles which had existed in the previous Pharmacopœia, and which experience has proved to be either useless or superfluous. The reader will perceive that the Committee have not been sparing in their task.

Acetum Britannicum.	Confectio Catechu composita.
Cantharidis.	Opii.
Colchici.	Rutæ.
Destillatum.	Cupri Ammonio-sulphas.
Opii.	Decoctum Amyli.
Scillæ.	Chimaphilæ.
Acidum Aceticum Camphoratum.	Cydonii.
Nitromuriaticum.	Dulcamaræ.
Ammoniae Bicarbonas.	Gallæ.
Aqua Anisi.	Guaiaci.
Cassiae.	Lini Compositum.
Potassæ effervescens.	Mezerei.
Pulegii.	Myrrhæ.
Sodæ effervescens.	Senegæ.
Atropiæ Sulphas.	Tormentillæ.
Calamina Præparata.	Ulmi.
Ceratum Calaminæ, and all the cerates.	Uvæ-ursi.
Confectio Aurantii.	Emplastrum Ammoniaci.
Cassiae.	Assafoetidæ.

Emplastrum Cumini.	Spiritus Carui.
Potassii Iodidi.	Cassiae.
Essentia Anisi, and all the essences.	Cinnamomi.
Extractum Colocynthis.	Menthæ viridis.
Digitalis.	Pimentæ.
Lactucæ.	Pulegii.
Papaveris.	Vini Gallici.
Pareiræ.	Strychniæ Murias.
Uvæ-ursi.	Syrupus Aceti.
Ferri Ammonio-chloridum.	Acidi Citrici.
Valerianas.	Althææ.
Hydrargyri Bisulphuretum.	Cocci.
Hydrargyrum cum Magnesia.	Croci.
Infusum Armoraciæ Compositum.	Ipecacuanhæ.
Juniperi.	Morphiæ Acetatis.
Menthæ viridis.	Muriatis.
Pareiræ.	Rhamni.
Simarubæ.	Sarsæ.
Iodidum Sulphuris.	Violæ.
Linimentum Æruginis.	Tinctura Cardamomi.
Liquor Aluminis Compositus.	Cassiae.
Ammoniae Citratis.	Castorei Ammoniata.
Arsenici Chloridi.	Cubebæ.
Hydrargyri Bichloridi.	Cuspariæ.
Arsenici et Hydrargyri Hy-	Ferri Ammonio-chloridi.
driodatis.	Guaiaci.
Morphiæ Acetatis.	Hellebori.
Zinci Chloridi.	Lactucarii.
Mel Rosæ.	Matico.
Mistura Gentianæ Composita.	Opii Ammoniata.
Mistura Spiritus Vini Gallici.	Quassiae.
Morphiæ Acetas.	Trochisci Acaciæ.
Oleum Æthereum.	Acidi Tartarici.
Oxymel Scillæ.	Cretæ.
Pilula Conii Composita.	Glycyrrhizæ.
Cupri Ammoniata.	Lactucarii.
Digitalis et Scillæ.	Magnesiæ.
Ferri Sulphatis.	Sodæ Bicarbonatis.
Ipecacuanhæ et opii	Unguentum Æruginis.
cum Scilla.	Conii.
Plumbi Iodidum.	Opii.
Nitræ.	Picis.
Oxidum Rubrum.	Picis liquidæ.
Pulvis Aluminis Compositus.	Plumbi Iodidi.
Quinæ Murias.	Sambuci.
Valerianas.	Vinum Gentianæ.
Sodæ Sulphas.	Rhei.
Spiritus Ætheris Compositus.	Tabaci.
Ammoniae.	Veratri.
Anisi.	

The following list shows the preparations which are either new or which formerly found a place in one or two, but not in all the British Pharmacopœias. When no letter as L., E., or D. follows the name of the preparation, it is to be understood that the preparation is altogether a new one.



- Acidum nitro-hydrochloricum dilutum (D.)  
 Aqua Anethi (L. E.)  
     Carui (L. D.)  
     Fœniculi (E. D.)  
     Laurocerasi (E. D.)  
     Sambuci (L. E.)  
 Argenti oxidum (D.)  
 Beberiae sulphas.  
 Calcis carbonas præcipitata (D.)  
     phosphas præcipitata (D.)  
 Cataplasma carbonis (L.)  
     Conii. (L.)  
     Fermenti (L.)  
     Lini (L.)  
     Sinapis (L.)  
     Sodæ chloratæ (L.)  
 Chloroformum (L. D.)  
 Collodium.  
 Confectio Scammonii (L. D.)  
     Sulphuris (D.)  
     Terebinthinæ (D.)  
 Decoctum Cinchonæ flavæ (L. E.)  
     Granati radicis (L.)  
     Hordei (L. D.)  
     Pareiræ (L.)  
     Scoparii (D.)  
     Taraxaci (L. E.)  
 Digitalinum.  
 Emplastrum calefaciens (D.)  
     Galbani (L.)  
     Picis (L. E.)  
 Enema Aloes (L.)  
     Magnesiæ sulphatis (E. D.)  
     Opii (L. E.)  
 Extractum Aconiti (L. E.)  
     Aloes Socotrinæ (L.)  
         Barbadensis (L.)  
     Anthemidis (E.)  
     Belæ liquidum.  
     Calumbæ.  
     Cinchonæ flavæ liquidum.  
     Colchici (L.)  
     Ergotæ liquidum.  
     Filicis liquidum  
     Hæmotoxyli (L. E.)  
     Jalapæ (L. E.)  
     Krameriæ (E.)  
     Lupuli (E.)  
     Nucis vomicæ (L. E.)  
     Opii liquidum.  
     Pareiræ liquidum.  
     Quassiæ (E.)  
     Stramonii (L. E.)  
     Taraxaci (L. E.)  
 Fel bovinum purificatum.  
 Ferri arsenias.  
     et Ammoniae citras (L. D.)  
 Ferri et Quiniæ citras.  
     peroxidum hydratum (E. D.)  
     phosphas.  
     sulphas granulata (D.)  
 Ferrum redactum (D.)  
 Infusum Chiratæ (E. D.)  
     Cinchonæ flavæ (L. E.)  
     Cusso.  
     Dulcamaræ.  
     Ergotæ (D.)  
     Krameriæ (L. D.)  
     Lupuli (L.)  
     Maticæ (D.)  
     Senegæ (E. D.)  
     Serpentariæ (L. E.)  
     Uvæ Ursi.  
     Valerianæ (L. D.)  
 Jalapæ resina (E.)  
 Linimentum Aconiti.  
     Belladonnæ.  
     Camphoræ compositum (L. D.)  
     Cantharidis.  
     Chloroformi.  
     Crotonis.  
     Hydrargyri (L. D.)  
     Iodi.  
     Terebinthinæ aceticum.  
 Liquor Antimonii terchloridi (D.)  
     Atropiæ.  
     Calcis chloratæ (L. D.)  
         saccharatus.  
     Ferri perchloridi.  
         pernitratis (D.)  
     Hydrargyri nitratis acidus (D.)  
     Potassæ permanganatis.  
     Sodæ (L. D.)  
         chloratæ (L. D.)  
         arseniatis.  
     Strychniæ.  
 Lithiæ citras.  
 Mistura Ammoniaci (L. D.)  
     Creasoti (E.)  
     Ferri composita (D.)  
     Guaiaçi (L. E.)  
 Mistura Scammonii (E.)  
 Pilula Assafœtidæ composita (E. D.)  
     Cambogiæ (L. E.)  
     Colocynthis et Hyosecyami (E.)  
     Ferri carbonatis (E.)  
         iodidi.  
     Plumbi cum Opio (E.)  
 Podophylli resina.  
 Potassæ chloras (L. D.)  
     citræ.  
     permanganas.  
 Potassii bromidum.  
 Pulvis Amygdalæ compositus.

Pulvis Catechu compositus (D.)  
 Kino cum Opio (L.)  
 Rhei compositus (E. D.)  
 Tragacanthæ compositus (L. E.)

Santoninum.

Scammoniae resina.

Soda caustica.

Sodæ arsenias.

Spiritus Armoraciæ compositus (L.)

Cajuputi

Chloroformi.

Juniperi.

Lavandulæ (E.)

Menthæ piperitæ (L. E.)

Myristicæ (L. E.)

Rosmarini (L. E.)

Succus Conii.

Scoparii.

Taraxaci.

Sulphur præcipitatum (L.)

Suppositoria Acidi tannici.

Morphiæ.

Syrupus Ferri phosphatis.

Floris Aurantii.

Hemidesmi (D.)

Mori (L.)

Papaveris (L. E.)

Rhæados (L. E.)

Rosæ Gallicæ (E. D.)

Scillæ (E. D.)

Sennæ (L. E.)

Tinctura Aconiti (L. D.)

Aloes (L. E.)

Arnicae.

Belladonnæ (L. D.)

Benzoini composita (L. E.)

Bucco (E. D.)

Cannabis Indicæ (D.)

Castorei (L. E.)

Chiratae (D.)

Cinnamomi (L. E.)

Cocci (D.)

Conii fructus.

Croci (E. D.)

Ergotæ (D.)

Tinctura Guaiaci ammoniata (L. E.)

Kino (L. E.)

Krameria (D.)

Limonis (L. D.)

Lobeliae Ætherea (L. E.)

Nucis vomicæ.

Quiniæ composita (L.)

Sabinæ.

Senegæ.

Serpentaria (L. E.)

Stramonii (D.)

Valerianæ ammoniata (L. E.)

Trochisci Acidi tannici.

Bismuthi.

Catechu.

Morphiæ (E.)

et Ipecacuanhæ (E.)

Opii (E.)

Unguentum Aconitæ.

Atropii.

Belladonnæ (L.)

Calomelanos.

Cetacei (L. D.)

Cocculi (E.)

Elemi (L. D.)

Gallæ (D.)

cum Opio (L. E.)

Hydrargyri ammoniati  
(L. E.)

Hydrargyri iodidi rubri  
(D.)

Plumbi subacetatis.

Potassii iodidi (L. D.)

Resinæ (E. D.)

Terebinthinæ.

Veratriæ.

Veratria (L. E.)

Vinum Aloes (L. E.)

Colchici (L. E.)

Ferri.

Zinci acetas (D.)

carbonas (D.)

chloridum (L. D.)

valerianas (D.)

The following list shows the name of the preparations which for the first time appear in a British Pharmacopœia :—

Acidum Nitro-hydrochloricum dilutum.

Sulphurosum

Ammonia Benzoas.

Phosphas.

Antimonii Terechloridi liquor.

Beberia sulphas.

Collodium.

Digitalinum.

Extractum Calumbæ.

Extractumol Cocynthidis compositum.

Cinchonæ Flavæ liquidum.

Ergotæ liquidum.

Filicis liquidum.

Opii liquidum.

Pareiræ liquidum.

Fel bovinum purificatum.

Ferri arsenias.

et quinae citras.



Ferri phosphas.	Sodæ arsenias.
Perchloride liquor.	Spiritus Cajuputi.
Infusum Cusso.	Chloroformi.
Dulcamaræ.	Juniperi.
Vvæ Ursi.	Pyroxilicus rectificatus.
Linimentum Aconiti.	Succus Conii.
Belladonnæ.	Scoparii.
Chloroformi.	Taraxaci.
Cantharidis.	Suppositoria Acidi tannici.
Iodi.	Morphiæ.
Terebinthinæ aceticum.	Syrupus Ferri phosphas.
Liquor Atropiæ.	Floris Aurantii.
Calcis saccharatus.	Tinctura Arnicæ.
Ferri perchloridi.	Conii fructus.
Potassæ permanganatis.	Sabinæ.
Sodæ arseniatis.	Senegæ.
Strychniæ.	Trochisci Acidi tannici.
Lithiæ citras.	Bismuthi.
Pilula Aloes Barbadensis.	Catechu.
Ferri iodidi.	Morphiæ et Ipecacuanhæ.
Podophylli resina.	Unguentum Aconitiæ.
Potassæ citras.	Atropiæ.
permanganas.	Calomelanos.
Potassii bromidum.	Plumbi subacetatis.
Santoninum.	Terebinthinæ.
Scammoniæ resina.	Veratriæ.
Soda caustica.	

*Notice of some of the Differences in Strength of Preparations of the British Pharmacopœia, and those of London, Edinburgh, and Dublin.*

When changes of strength have been made in very active preparations, which have been long in use, the strength has been diminished and not increased.

Thus, *Acidum Hydrocyanicum dilutum* contains 2 per cent. of the anhydrous acid; which is exactly the strength of the acid of the London Pharmacopœia, but which is weaker than that of the old Edinburgh Pharmacopœia, which contained 3·3 per cent.

*Tinctura Aconiti* is now only one-third as strong as the preparation of the late London Pharmacopœia, and less than one-fifth as strong as the tincture which bears the name of Fleming's tincture.

*Tinctura Belladonnæ* is only one-half the strength of the tincture of the London and Dublin Colleges.

*Tinctura Opii* is one-twelfth weaker than it used formerly to be.

Many preparations have been very much increased in strength; they are, however, of such a nature, that no serious accident would occur by the new being substituted for the old preparation.

*Liquor Ammoniacæ Acetatis* is about five times as strong as the old preparation of the London Pharmacopœia.

The strength of the tinctures has been made as far as possible uniform.

*New Preparations.*—Very few new drugs have been sanctioned by the British Pharmacopœia; amongst those which have been introduced, the majority will probably be found inferior to medicines which have been long in use.

*Cusso*, for example, is introduced as an anthelmintic. That its action is in many cases quite satisfactory there can be no doubt, although, from personal observation, we are led to place much greater reliance in the older male fern.

The *Citrate of Lithia* is a preparation whose use will be very limited; evidence is, in our opinion, altogether wanting, to show that it possesses any decided advantage over the much cheaper citrates of potash and soda.

*Digitalinum*, the intensely active neutral principle of digitalis, is one of the new medicines which will have to be used with the greatest care. The dose for man is from  $\frac{1}{100}$  to  $\frac{1}{50}$ th of a grain.

*Permanganate of Potash* is one of the most useful of the new preparations. A solution of this salt has been long in use, under the name of Condry's fluid. It is an admirable disinfectant, in virtue of its power of oxidizing organic matters with which it is brought in contact. The *Liquor Potassæ Permanganatis*, of the British Pharmacopœia, when largely diluted with water, will constitute an admirable gargle in some cases of ulceration of the throat, and a very good lotion for foul and offensive ulcers. For this purpose, four fluid drachms of the "liquor" may be diluted with seven and a-half ounces of water. Although few new drugs have been introduced into the Pharmacopœia, some new preparations of medicines long in use will be found infinitely preferable to the old.

A class of preparations, termed *fluid extracts*, has been introduced, which, we have no doubt, will be largely prescribed, and which will prove of great use. Amongst those the most important are the following:—

*Extractum Filicis liquidum.*—Oil of male fern.

*Extractum Ergotæ liquidum.*—One drachm is equivalent to 60 grs. of ergot.

*Extractum Cinchonæ Flavæ liquidum.*—One drachm is equivalent to  $\frac{1}{2}$  oz. of yellow bark.

*Extractum Pareiræ liquidum.*—One fluid ounce is equivalent to one ounce of Pareira.

Solutions of the two alkaloids, Strychnia and Atropia, are now officinal.

*Liquor Strychniæ* contains grs. iv. of strychnia in one fluid oz.

*Liquor Atropicæ* contains the same quantity of atropia. This preparation is intended only for external use (for the purpose of dilating the pupil).

Amongst the Liniments, we find two which call for special notice:—

*Linimentum Belladonnæ* is a tincture of belladonna and cam-



phor, and is two times stronger than the *Tinctura Belladonnæ* which is intended for internal use.

*Linimentum Aconiti* is about eight times stronger than the *Tinctura Aconiti*. The above two preparations must be used with the greatest caution.

The last series of preparations to which we shall direct attention are the ointments.

Ointments of the three alkaloids — *Aconitia*, *Atropia*, and *Veratria* have been introduced. These ointments contain one grain of the alkaloid in the drachm. They must be used with the very greatest caution. *Unguentum Aconitiæ* and *Unguentum Veratriæ* are to be used as anodynes in cases of neuralgia. *Unguentum Atropiæ*, we imagine, is intended for cases of affection of the eye, where the action which Belladonna and its alkaloid *Atropia* possess of dilating the pupil, and at the same time allaying irritation, is desired.

We must here draw to a close our analysis of the British Pharmacopœia. We have attempted to give a *resumé* of the more important changes in pharmacy which it has effected. For ample information on all the topics touched upon, we must refer the reader to the very useful papers which have of late appeared on this subject in the weekly medical periodicals, and more especially to the lectures delivered by Professor Garrod before the Royal College of Physicians of London.

# EDINBURGH VETERINARY REVIEW

AND

## Annals of Comparative Pathology.

---

### THE "DISEASED CATTLE" AND "THE CATTLE AND MEAT IMPORTATION" ACTS.

THE article which appeared in our last on the "Prevention of Cattle Disease," was penned when we little thought how completely Government were prepared to act up to the spirit of our suggestions. Two Bills were read for the first time on the 19th of February, and for the second on the 9th of March, when they were referred to a Select Committee. Private bills are often referred to such a committee, but Government measures only, when it is felt that the subject to which any Bill refers requires to be thoroughly understood and appreciated by Members of the House. The wisdom of sifting the question thoroughly before passing any measure into law cannot be over-estimated; and with time and talking, the bare and shallow nature of the arguments used against legislation appears more and more distinctly. When the Bills first appeared, interested parties, not including those farmers who tamper with the diseased-cattle traffic, called out for unqualified opposition. As this would not answer, a compromise was carried out, and, under the guise of amendments, the most unwarrantable mutilations are advocated by the farmers' (?) friends. The Bills are not all that could be desired, and we feel confident, that when evidence has been led upon the subject, clauses will be framed to add, in one sense, to the stringency of the proposed laws, and in another, to render the working of the acts more in accordance with the circumstances under which they must be enforced against those who deliberately trade in diseased stock.

In the first part of the Diseased Cattle Act, persons are prevented from exposing diseased cattle, so as to endanger the health and lives of other animals, and, strange to say, the objectors to the bills find fault with so natural a proposition as the following:—"Any Justice of the Peace may, upon the application of any constable, or of any owner of cattle or his servant, make an order directing any constable to remove any diseased cattle to a place where they can be safely kept without risk of infecting



other cattle ; and all expenses incurred in the removal may be recovered from the owner in a summary manner.”

No one dare to attack the following clause, and it is passed over unnoticed, whereas, in reality, it is the most severe that we can find in the two bills:—

“ 6. If the owner of any diseased cattle, knowing or having reasonable cause to suspect the existence of disease, sells the same to a purchaser without giving notice to him of such known or suspected disease, he shall, in addition to any penalty which may be imposed on him by this Act, be deemed to have been guilty of fraud in making the sale, and be liable in damages to the purchaser for any loss or injury the purchaser may have sustained by reason of or consequential on his having purchased the said diseased cattle.”

Great offence has been given by the clause 14 of the Diseased Cattle Act, and which reads as follows:—

“ 14. Every railway, canal, or other company or common carrier may refuse to carry and prohibit from entering on their or his premises any cattle that in the opinion of any officer of the company or of such carrier or any servant of his may be diseased ; and any such company or carrier as aforesaid may recover in a summary manner from the owner or the person in charge of any diseased cattle that they or he may have carried without knowing the fact of their being diseased, any expenses they or he may be put to in disinfecting their or his trucks, boats, or other vehicles, or otherwise may incur by reason of having carried such diseased cattle ; and in addition thereto any person tendering any diseased cattle for carriage to any company or common carrier, knowing or having reasonable cause to suspect the existence of the disease, shall be liable to a penalty, to be paid to the company or common carrier, not exceeding *ten shillings* a head for each head of cattle so tendered.”

There is certainly reason for some alarm here, as few would like to trust to railway porters for an opinion concerning the healthy or diseased state of stock, though, perhaps in the majority of instances, they would know full well what to include. But, with singular inconsistency, objections are mooted against the appointment of properly qualified inspectors. This wise provision has given great offence to some, and it has been regarded as a job of the first water. When the great agricultural associations prepare to hold a show at any part, they appoint the best veterinary surgeon they can get to see that no diseased animals are allowed on the grounds for weeks before exhibition, and they have veterinarians to inspect stock in the show-ground, and yet they object to “cattle-inspectors” of markets, and prefer leaving matters in the hands of a market clerk. Are market clerk’s of a higher order of intelligence than railway porters, and have they any more special training in the subject of diseased stock? Our experience is not favourable to market clerks, and those which we have found anxious to do their duty, have spoken of the great

boon that would be conferred on buyers of stock and on markets if qualified inspectors were appointed to keep diseased animals from coming in contact with the healthy. It so happens, that in the Bills before the House there is a serious omission as to the definition of a cattle-inspector, for if such an officer is to be of no higher grade than many inspectors of meats, superintendents of slaughterhouses, &c., such as we have met with, the sooner the clauses referring to such an officer are expunged the better. We feel, however, that in various parts of the country veterinarians are already being appointed, and we have great faith in the influence of good example. As the clauses relating to cattle-inspectors affect our profession in a special manner, we here reproduce them :—

“ 15. Any local authority, as hereinafter defined, may make regulations with respect to the examination of all cattle brought to or on their way to any market or fair held within their jurisdiction; and it shall be lawful for any officer appointed by such local authority, and hereinafter called a Cattle-Inspector, to examine the said cattle, and to exclude from the market or fair any of them that he may deem to be affected with any contagious or infectious disease, or, in the case of cattle used for human food, with any other disease rendering them unfit for human food, and to require any cattle affected with any infectious or contagious disease to be forthwith removed to such distance from the market or fair as the Cattle-Inspector may think necessary for preventing the spread of infection: Any person obstructing the said Cattle-Inspector in performance of his duties, or refusing to comply with his orders, shall be liable, for every offence of obstruction or non-compliance, to a penalty not exceeding five pounds, and to all expenses that may have been occasioned by such obstruction or non-compliance; and all constables are required, on the request of the said Cattle-Inspector, to assist him in carrying into execution the powers conferred by this section.

“ All powers conferred on the said Cattle-Inspector by this section shall be deemed to be in addition to any other power which he may be enabled to exercise under the other provisions of this Act, and it shall be lawful for him to take such steps as may be thought expedient for enforcing any other provisions of this Act.

“ 16. Subject to the exceptions and provisions hereinafter contained, the following bodies shall respectively be the local authorities to appoint Cattle-Inspectors, under this Act, in the districts hereinafter mentioned; (that is to say,)

“ (1.) In the city of London, the Court of the Lord Mayor and Aldermen of the said city :

“ (2.) In the area subject to the jurisdiction of the Metropolitan Board of Works, exclusive of the City of London, the Metropolitan Board of Works :

“ (3.) In the City of Dublin, the Right Honourable the Lord Mayor, Aldermen, and Burgesses by the Council; and in any other municipal borough in England or Ireland, the Mayor, Aldermen, and Burgesses by the Council :

“ (4.) In any place other than a municipal borough situate in England or Ireland, and within the jurisdiction of any trustees or improvement commissioners appointed under the provisions of any local or general Act of Parliament, or within the jurisdiction of any local board of health, the trustees, or commissioners, or local board of health :



“(5.) In any burgh or place in Scotland within the jurisdiction of any town council, and not subject to the jurisdiction of police commissioners or trustees, the town council; but in any burgh or place in Scotland within the jurisdiction of police commissioners or trustees exercising the functions of police commissioners, the police commissioners or trustees :

“(6.) In any place in England, Ireland, or Scotland, not within the jurisdiction of any local authority as hereinbefore defined, the justices of the county in which the place is situate in general or quarter sessions assembled :

“The salary of the Cattle-Inspector, and all expenses incurred by him in enforcing the provisions of this Act, shall be payable out of the dues, tolls, or stallages receivable in respect of the markets or fairs of which he is appointed Inspector; but in default of any such dues, tolls, or stallages, or in so far as the same are insufficient, shall, where he is appointed by the justices of a county, be defrayed out of the county rate, or rate in the nature of a county rate leviable by them; and in cases where he is appointed by any other local authority, be defrayed out of any rate leviable by that local authority.

“For the purposes of this section, a county shall not include a county of a city or county of a town, but shall include any riding or other division of a county or liberty having a separate commission of the peace.

“17. The following exceptions and provisions shall be made with respect to the appointment of a Cattle-Inspector under this Act.

“(1.) No fresh appointment of a Cattle-Inspector, under this Act, is required to be made in any case where an officer exercising the like or similar functions already exists, and in such a case the existing officer shall be deemed to be invested with all the powers of a Cattle-Inspector as appointed under this Act :

“(2.) Where the right of holding or to receive the profits arising from holding any market or fair is, by Act of Parliament, vested in any body of persons or person other than a local authority, as hereinbefore defined, the power of the local authority to appoint a Cattle-Inspector shall not arise until the said body of persons or person have or has for some period of three months made default in appointing a Cattle-Inspector, which appointment they or he are and is hereby authorised to make.

“18. All powers given by this Act to a local authority shall be deemed to be in addition to and not in derogation of any other powers conferred on that authority by Act of Parliament, law, or custom, and such local authority may exercise such other powers in the same manner as if this Act had not passed.”

The schedule of diseases appended to the Diseased Cattle Act is undoubtedly very faulty, but the errors are of omission rather than commission. We have been wonderfully astonished to hear that Professor Simonds objects to the foot-and-mouth-disease being placed in that schedule, and that he has had the “*honor*” to accompany a deputation of butchers and salesmen to stipulate for amendments in the Bills. This most undignified procedure can little affect the question at issue, as it can readily be proved that the foot-and-mouth-disease is a most serious affection, and readily prevented by attention to cleanliness and warding off contagion. However, there is no more certain fact that our infant population suffers largely from the use of milk of the cows affected with the foot-and-mouth-disease.

The very liberal gentlemen at the head of the opposition in

Scotland think that the foreign traders ought to have the privilege of exclusion of the foot-and-mouth-disease from the list of contagious maladies. Because we have suffered much, and the disease has been so general as to be regarded as quite unmanageable, we are expected to put up with suffering even more, and the only way whereby we can be protected—viz., by looking very sharply after our foreign importations—is to be denied us! We can safely leave the matter in the hands of the Select Committee appointed; and we trust that the hearty support of all members of the profession may be secured in a cause which affects them as much as it affects the stockowner or any other section of the community.

### MEETINGS OF SOCIETIES.

## THE LANCASHIRE VETERINARY MEDICAL ASSOCIATION.

### THE SECRETARY'S OFFICIAL REPORT.

THE annual meeting of the above Association was held at the Brunswick Hotel, Piccadilly, Manchester, on Wednesday evening, the 9th of March. The attendance of members and visitors was the largest ever known since the formation of the Society, comprising the following gentlemen:—

Mr THOS. GREAVES, <i>President</i> , Manchester.	Mr WILLIAMS, Bradford, <i>Sec.</i> , Yorkshire Vet. Med.
„ ROGOR HAMPSON, <i>Treasurer</i> , do.	„ MORGAN, Liverpool.
„ JOHN LAWSON, do.	„ CARTWRIGHT, Whitechurch.
„ WILLIAM HAYCOCK, do.	„ W. CHALLINOR, Pendlebury.
„ GEORGE SUMONS, do.	„ JAS. B. TAYLOR, Mottram.
„ JAS. HASLAM, do.	„ R. BRIDGE, Bury.
„ PETER TAYLOR, do.	„ JOHN GREAVES, Altringham.
„ A. L. GIBSON, do.	„ HOWELL, Rockdale.
„ W. DIXON, do.	„ WHITTLE, Worsley.
„ J. TAYLOR, Oldham.	„ CARTER, Bradford.
„ BROWN, do.	„ NAYLOR, Wakefield.
„ A. HAMPSON, Bolton.	„ JOS. HALFEY, Southport.
„ BROOKS, Pilkington.	„ LEECH, Bakewell.
„ SUTTALL, Rawtinstall.	

Upon the private business of the Association being concluded, the President delivered the following inaugural address:—

### PRESIDENT'S INAUGURAL ADDRESS.

GENTLEMEN,—In taking my place before you this evening, in the capacity of your President, and assuming for the first time



the responsibilities of the office, I feel a considerable degree of diffidence, being well aware of my own deficiencies and imperfections. I cannot but feel proud of the distinguished and honourable position in which you have been pleased to place me—viz., to preside over so large, intelligent, and influential a body of veterinary surgeons as I see before me; but I must confess, I doubt whether you have got the right man in the right place. I very much fear I shall not be able to initiate and infuse that vigour, that energy of mind, that earnestness of purpose, which ought to emanate from the chair, and be made to pervade and animate each member individually. I repeat, I very much fear I shall be found only a poor successor to our very worthy and deservedly-esteemed ex-President, Mr Lawson; but since you have made your election—since you have made your bargain—I presume there is nothing for it, only for us to abide by that bargain; as the Paddy said, a good bargain is all very well, but a bad bargain is better than no bargain at all. In Leeds, where it was my happiness to be present at the Yorkshire Veterinary Association the other week, they have made no mistake. There is no doubt about their president; they have got the right man in the right place. I have great pleasure in reporting to you that their president received me with great cordiality as your representative. I was an entire stranger to all there but two or three. The respect and courtesy that were shown me I esteemed as a compliment to you; and I must say, I felt honoured to be the president of a body so much respected; and I know, whenever opportunity occurs, this respect will be reciprocated by you.

Gentlemen, I must ask you to kindly accord to me your indulgence and attention, whilst I deliver what I believe to be the first inaugural address ever attempted before a veterinary audience in Lancashire. The annual addresses delivered at our *alma mater*, although always of an unexceptionable excellence, are framed with a view of being chiefly applicable to the student. Therefore an essentially different class of phrases are required when addressing an audience composed entirely of experienced and business men, some of whose honoured heads have grown grey in the service of their country. My address will be found a simple, plain, homely exposition of facts in connection with veterinary science. I have found it utterly impossible to compress within reasonable bounds the whole of the matter I felt anxious to have commented upon—such, for instance, as the science of botany and agriculture; the manner they are linked to our science, and how the best interest of each is bound up with the other. I should like to have made some observations upon the subject of vivisection, veterinary jurisprudence, the question of soundness of horses, and also upon the question of breeding stock, the great importance of a wise intelligent selection, &c., &c. It would also have been a most interesting inquiry to have

examined the question of the desirability of a superior education of the veterinary student ; but time and space forbid it. In this address, I have not aimed at producing a learned dissertation. Some of my hearers may complain that it is not sufficiently scientific, nor clothed in sufficiently classical and flowery language ; but I have endeavoured to make some amends for this loss, by keeping steadily before my mind that which appears to me to be practical and useful ; and for that purpose, I have divided my subject into two parts, viz :—

1st, An epitomized retrospect of the veterinary profession in Manchester ;

2d, Veterinary medical associations, the important usefulness of which they are susceptible.

In reviewing a body of men, or a profession, as to its status in society, and comparing it with other bodies of men, or other professions, it must ever be borne in mind that to approximate the truth, we must always take into account the nature of the town or city, and the character of its inhabitants. I believe it is admitted on all hands that Manchester is a pre-eminently practical city, and its inhabitants are essentially a pound, shilling, and pence class of men, each diligently following his own individual avocation, almost altogether regardless of his next-door neighbour ; and where success is esteemed the best, if not the only proof of merit. The respectability and the dignity of our profession have been sustained by our predecessors in a position that will bear comparison with any other town or city in the kingdom. It is the proudest thought of my life to know this ; and as I look around me at this moment, I can see an array of veterinary talent and ability that is not surpassed, and, I believe I am right in saying, is not equalled in this or in any other country. The last time I had the happiness to meet you in this room, we were on the eve of breaking down an old custom, which had been often condemned by many right-minded men as being a habit deserving of censure, and in many instances entailing demoralizing effects. I am alluding to the giving of new year's gifts. At that time all kinds of rumours were in circulation. From one quarter we heard that our smiths threatened that they would turn out, because it would encroach upon their vested rights ; from another quarter, that the place would be turned out at the windows ; in another quarter, the likeness of a coffin was pasted along the side of the large notice intimating what would be required if these intentions were carried out ; and from all quarters the threat was loud and deep, that much of our income would be imperilled ; but at length the 1st of January 1864 came, and, so far as I am aware, the sun did not change colour on that day, neither was there an earthquake ; but this I believe did happen, there was a creditable peace and quietude in each of our establishments utterly unknown on any previous day ; and—to



the honour of Manchester be it said—I believe not one of its members swerved an hair'sbreadth from their mutual engagement, nor do I believe our business has suffered in the remotest degree ; at least I speak for myself.

This is, I believe, the largest and most influential meeting of English veterinary surgeons ever assembled together in this or in any other town out of the metropolis ; and let me remind you, gentlemen, that this association is the pioneer provincial veterinary association in England, and that Manchester still stands high in public estimation. . We have heard of the Manchester school before to-night. She is ever first and foremost in every great and good movement, whether it be social, political, or scientific. Yes, the voice of Manchester has been heard throughout the length and breadth of the land, and her influence felt in every clime. I have heard the voice of Manchester listened to with bated breath in our hall of legislature. But the House of Commons is not the only assembly in which the voice of Manchester has been heard ; for three years your respected ex-president, Mr Lawson, has raised his voice and used his vote upon every important question in our national veterinary council in London. The humble individual who has now the honour of addressing you has, on numbers of occasions, used his voice and his vote at that same council table. At the 15th annual meeting of the profession, on the 2d of May 1859, he had the honour to preside over that meeting. It has long been my opinion—and I am not alone in that opinion—that our present charter of incorporation is defective ; and at that time I suggested, in a letter to our present president of the Royal College of Veterinary Surgeons, that new powers should be applied for. I proposed to contribute L.50 as my share for that purpose. I find the council are now applying to Parliament for new powers. I hold in my hand a very kind letter received the other day from the president of the Royal College of Veterinary Surgeons, kindly explaining the objects they now seek ; and let me tell you, gentlemen, there is plenty of work yet to be done. There is work for each and all of us ; and I wish to ask you this question to-night—“Is Manchester, that stands so proudly forward in every other question, to occupy a place in the vanguard or in the rear as regards her veterinary politics ?” Do you say in the vanguard ? Then you must work to render her worthy of that distinction. Do you say you have not time ? Well, let me tell you plainly, this excuse will not bear investigation. It would be less incorrect to say, our innate love of ease and indolence induces us to spend our leisure time uselessly—absolutely uselessly—if not worse. We find a vast majority of mankind, from the beginning of the world to the present time, allow their mental faculties, and the higher capabilities of their moral and religious feelings, to lie dormant and unemployed ; but I am proud to know we have many in-



stances of gentlemen in our city who add lustre and honour to our city, and to our common profession. We have in our midst to-night a gentleman who has distinguished himself as a bold thinker and a bold writer ; and when we witness our ex-president, with his extensive practice, go up to London to the meetings of council seven times every year, and to Edinburgh once or twice every year, to exercise that fine perception of judgment necessary for an examiner, travelling a distance of over 3720 miles yearly, at an expense of over L.30 for railway fare alone, to say nothing about his loss of time—time which, you know, must be to him of far greater value and importance than money, as I have observed—all this, I say, we are under a deep debt of gratitude to that gentleman ; and I feel I must honour that man for his zeal and those great sacrifices he has so nobly, so generously, and so praiseworthily, for so many years laid upon the altar of veterinary science. I will give you another particular instance, as illustrating where there is a will there is a way. Eleven years ago, our respected ex-treasurer, Mr Peter Taylor (I make this allusion with every feeling of respect, and I know he will pardon me for alluding to it) sent me a note, bearing date 14th March 1853, excusing himself from attending our veterinary meetings, on the ground “that his time was fully occupied.” Well, since then his business has considerably increased : he stands higher, and deservedly higher, in the estimation of the public of Manchester. Add to this, the claims upon his time in his domestic circle are much greater now than then ; still, paradoxical as it may seem, he can now find time to attend these meetings, and attend them, too, more punctually than any other member ; and he has proved himself a better member—a more useful working member—than any other, without a single exception. The very excellent essay he has compiled, and read before us, has done him infinite credit ; it is of itself a work of no light importance ; it at once establishes his claim upon our gratitude and our admiration. With these noble examples before us, it will be seen it only wants the heart in the cause, and there will always be found a way to accomplish great results. In our daily life, on a cursory view of human nature, we see many things calculated to perplex and embarrass us. We see, for instance, men rich in intellectual attainments, unable to secure for themselves a sufficiency of ordinary necessities ; whilst, on the other hand, we frequently see plain uneducated men, of unquestionably a lower order of intellect, quietly and diligently plying their avocations ; it being an invariable rule with such men, under all circumstances, to execute business with prompt and decisive action, and, by a wise economical application of time and means, amassing money ; and in a few years of wholesome thrift we see such a one rolling in wealth. We are apt to refer matters of this kind to some mysterious dispensation of Providence beyond our comprehen-



sion, and wholly independent of human control ; but, on a closer inspection of the circumstances of any particular case, we often find all mystery vanishes, and we are able to trace man's failures to natural causes. It will frequently be found that such failures are referable to some weak point in mind or body, to a defect in the balance of power amongst the different functions of his nature. He is a victim to the baneful effects of that worst of all habits, procrastination and incomplete resolves—a want of nerve and energy, an insufficiency of animal and moral courage, which is necessary for success in the practical struggle of life. With him there is a constant miscalculation of time and means, occasioning continual hurry, difficulty, expedients, penury.

We will now take a cursory view of the veterinary friends we have lost in Manchester. The constant and frequent changes that are taking place amongst us is something remarkable, considering the small number of our members who are practising here at any one period of stated time. During the thirty years I have been engaged in the pursuit of this profession in this city I have lost not less than twenty-three fellow practitioners through death. When first I commenced my career, there were nine veterinary practitioners in this town in life's full vigour, as we ourselves are now, who, with only one solitary exception, are all of them long since gone to that bourne from whence there is no returning:—Mr Peplow, he is dead; Mr Sefton, Mr Frank Myatt, Mr Bird, they too are dead; Mr Matthew Gibson, whose name is never mentioned but in terms of sincere respect to his memory, he too is dead; Mr John Taylor, that man of indefatigable and untiring energy, whose practical judgment was deservedly esteemed far and wide, he too is dead; Mr Thomas Taylor, whose activity and diligence in his profession, combined with great abilities, left him much respected by all who knew him, he too is dead; Mr James Taylor, their father, after an industrious and useful career, having accumulated a competency, retired from the profession to enjoy for many years a green old age, he too is dead; and last, though not least respected, Mr James Hollinworth, that brilliant little gentleman, that vivacious and eminently successful practitioner, who to know was only another word for to respect and to esteem him, he too is dead. As a dream, all this has past before me; the only survivor is my very much respected and truly esteemed relative and tutor, Mr John Greaves, of Altringham: to him I am indebted for planting in my mind useful practical knowledge; it is to the principles he so faithfully and earnestly inculcated in my youth that I can ascribe the honour and the distinguished position I this moment occupy amongst you, and for which I shall ever entertain a lively sense of gratitude to the end of my days. I have heard our esteemed ex-president say, "I know no veterinary surgeon's name spoken of with more respect than is the name of John Greaves;" we are proud in having the

honour of his presence this evening. Yes, gentlemen, and since then we have lost from among us, Mr Joseph Gibson, Mr William Deardin, Mr John Barlow, Mr John Gibson, Mr Andrew Howarth, Mr Samuel Dean, Mr Gilbert Fulton, Mr Thomas Ball, Mr Joseph Ball, Mr Peter Hulme, Mr Thomas Tennant, Mr Matthew Poet, Mr Isaac Worthington, Mr Isaac Gladwin, Mr Isaac Gladwin, senior. This startling rate of mortality, which is at the rate of one death in every fifteen months, out of a professional body whose living members have seldom if ever exceeded twelve at a time is something startling. Only ten years ago, a small society of veterinary surgeons used to meet together in this very house, we used to assemble together as we ourselves are now assembled, and we conversed together pretty much in the same manner as we are now conversing, they plodded the same streets we tread, but since then death has made sad havoc in that little band of ten members, only four now surviving, three only remaining in the profession. Such, my friends, is life, and even now scarcely a week passes without the King of Terrors making an attempt as it were, to snatch one or another of us from out of our midst by accident or sickness. Is it not, I would ask, matter sufficiently solemn to awaken many serious thoughts? They are facts that sound to me like unto footfalls on the confines of another world; let us think on it, for it warns us that our time is approaching as irresistably as the silent tread of an earthquake.

Gentlemen, I have thought it not out of place to pay what appeared to me a fitting tribute of homage to the memory of our departed veterinary friends, the contemplation of which discloses to us how close we stand, in the midst of our ambitions and successes, to the dark and voiceless grave. We see the cypress vies with the orange blossoms, and we turn with sorrow to note the losses we have sustained by death.

#### VETERINARY MEDICAL ASSOCIATIONS—THE IMPORTANT USEFULNESS OF WHICH THEY ARE SUSCEPTIBLE.

In the very excellent inaugural address delivered the other week in Leeds, I had the happiness to hear the President very beautifully illustrate the tendencies of this enlightened age to form associations. Amongst others, he referred to co-operative associations, and veterinary medical associations in various parts of England, and also in Scotland, and he further illustrated it by the contemplated association of Sovereigns invited to a congress in Paris. I feel a strong desire that as many of the members of the Yorkshire Society as can should become members of our Association—to give us their countenance and support—and for our members to fully reciprocate it. Remember, whenever Lancashire and Yorkshire have heartily united their brawny and stalwart arms together, whether in a social or political movement, whether it be with a Wilberforce for negro emancipa-



tion, or with a Bright for repeal of the corn-laws, or in any other good cause, their power is irresistible. And remember further, that the great natural barriers which have separated the two counties from the beginning of time are now broken through, and that the Yorkshire hills are bored,—we are now as it were one family, one society. It appears to me these veterinary medical associations are the forerunners of a new era in our profession; but I particularly wish to impress upon your minds this fact, that neither veterinary medical associations, nor compacts of any other kind, can be lasting, unless there exists in such bodies leagued together a certain motive for cohesion, a certain number of inducements to union which renders their common dependence agreeable, and the task of management light; and moreover, that no system can succeed without the presence of favourable circumstances added to the influence of good laws. There must be a certain number of common interests which serve as intellectual ties of association. Now, I would ask, What are the common interests which draw us together? First, and foremost, I would say there is instinctively operating within us an undefinable feeling of self-interest, prompting us to come and listen to the remarks and opinions of others upon diseases and important questions with which we individually are daily and hourly contending in our business; we feel anxious to have an interchange of ideas, and are impelled by a strong intellectual desire to acquire more practical knowledge, by which we may with more ease administer relief, and with more certainty remove suffering and save life. We may truly liken it to an errand of mercy; for what object can be more laudable or praiseworthy? Talk of an heavenly calling being incompatible with an earthly calling; why, in its very contemplation it has an infinite charm. It is a proverb as old as it true, that there is more pleasure in giving than in receiving. There is not one of us, however humble, or however eminent, but he may impart some knowledge to others. So, in this you cannot fail to observe that there are two powerful motives operating to cement and perpetuate our association. Let us cordially co-operate and become strong by union, be actuated by one motive, viz., the advancement of our profession. The man who can sit in our midst listening for two or three hours at a time to the remarks, the best and most sensible remarks, made by experienced and practical men, and gain no benefit, must be a dolt indeed; the man of quick perception, the intelligent man, cannot fail to pick up and secure practical useful knowledge, which will be of more use to him in his daily vocation than gold, aye, than even fine gold. During the two years of our former Society, and the fifteen months of this Association, I have not heard a single jarring word spoken amongst its members, but everything to the contrary, the one vieing with the other to contribute something to the general good. You will observe, gentlemen, I am contemplating the high



moral grounds of usefulness of these associations. There are a great number of other aspects in which we might contemplate them, such, for instance, as their social aspects; the feeling of pleasure we must of necessity experience in being in each others society; by casual and incidental conversations upon all interesting cases then under our treatment; coming to mutual friendly understandings in reference to professional consultations; the consideration of the question of a more equitable rate of charge for shoeing, which, as matters at present stand, is a miserably inadequate pay, &c., &c. There is another aspect which I delineated at the Leeds Association, and which has been deemed worthy of insertion in the pages of the "Veterinarian" for this month. But there is still another important use which these associations may be made to subserve, and which I shall here characterise as being the greatest of them all, and I beg to call your very earnest attention seriously to this point—viz., they may be made to concentrate practical knowledge upon given points; for, although the Royal Veterinary College was founded for the purposes of developing and imparting veterinary knowledge, and the professors and teachers from first to last have done their duty nobly, still there are certain diseases with reference to the cure of which our knowledge is lamentably deficient; for instance, there is farcy, glanders, tetanus, canker, scarlatina, purpura hæmorrhagica in the horse, pleuro-pneumonia in cattle, rot and small-pox in sheep, rabies and hydrophobia in the dog.

Now, since we are living in an enlightened age, in which scientific discoveries have given us great advantages over our ancestors, and as it is my great desire to make this paper as truly useful and practical as possible, I would for that purpose respectfully and in all earnestness suggest that our Secretary be instructed to confer with the Secretaries of the Yorkshire Society, and the North of England Society, and also to invite our brethren on the other side the Tweed,—viz., the west of Scotland, to join with us to single out one of these diseases at a time,—tetanus, for instance, as one year's work, and another of these diseases, canker, for instance, for another year's work; and so on. Let us, I beg of you, do all we can do to accomplish this task; let us see what collective effort can do in multiplying knowledge; let every man in each of these societies put his shoulder to the wheel, and gain all the knowledge he possibly can upon this one point at a time. I want the energies of a whole people to be aroused to a great intellectual effort. I believe I shall be appealing to the most likely tribunal on earth to attain my purpose,—viz., to large bodies of educated and intellectual men in the hey-day of manhood, whose whole time and mind are occupied entirely with these kinds of cases. The wide area of practical experience that can be thus comprehended may enable us to accomplish something in our day and generation, and, with a view



of giving an impetus and an inducement to research, I respectfully suggest that the man who can discover a remedy that can cure nineteen out of every twenty cases shall have presented to him, not only the title of this Society's "Honorary Associate," but also a gold medal. I would stipulate no restrictions whatever. It should not matter whether he possesses a diploma or no diploma. I do not mean it must be the man who can write the best paper upon these diseases, or the man who can cure a casual case; for we can any of us do that now. He must practically develop a certain specific mode of cure, and make the same fully known to us; and as I am one of those men who utterly abominate all shams and barren efforts, I will gladly make an annual contribution of L.10 towards that purpose. But you will perhaps say, these things are insurmountable; and some of you may be ready to charge me with being an enthusiast. To such a charge I can only say, I should feel proud if only I was deserving of it. Sir Humphry Davy, with his small lighted lamp in his hand, stands undaunted in the very teeth of the death-blast without fear. He feels there is an immunity from danger; he has robbed death of all his terrors in the mine. Yes, there he proudly, nobly stands, receiving the homage and the blessings of a whole world! He is one of the greatest and grandest monuments in honour of enthusiasms. Dr Jenner, after twenty-five years of patient, unremitting experiments with small-pox and cowpox, is at length triumphant. Behold him, too, as he proudly and nobly stands, his vanquished victim lying at his feet, and receiving the homage and the blessings of a grateful people. There he stands, another of England's greatest and proudest monuments in honour of enthusiasm. Yes, Newton, Shakspeare, Watt, Stevenson,—the latter was declared a lunatic, in addition to an enthusiast, because he said he would drive a locomotive at the rate of 12 miles an hour; and last, though not least, Richard Cobden of our own time,—they were all of them enthusiasts upon the particular subjects to which they had devoted and consecrated their lives, and England is proud to call them her sons. In fact, every great man who ever did exist, and probably every great man who ever will exist, must be an enthusiast. It is because he is an enthusiast that he becomes a great man. But there may be others of you who are ready to say—the task I want to accomplish is chimerical or Utopian; that I am too sanguine, for no one will make such an hopeless attempt. Need I adduce any other proof to controvert such a timid statement, than the fact that one of our ablest members, certainly the best Veterinary microscopist and physiologist of the day, is going to seize the bull by the horns in this very room to-night. I honour the man for his great courage and daring to grapple with so great a difficulty as pleuro-pneumonia in cattle. My prayer is, that his sagacity and penetrating intellect may lead him instinctively to

touch the secret spring, and unseal the fountain from whence will flow out the true knowledge of cure, and enable him to vanquish this terrible, intractable scourge ; or, if failing in being actually successful, he will be able to strip it of all its mysterious and insidious character, place its hideous proportions nakedly before us, and bring to bear upon it the full blaze of science, which will, in the end, result in the adoption of a certain cure. For, rely upon it as a certain truth, an arm which is ever willing and All-powerful will be stretched out to help us. We must never forget that God only helps those who help themselves. I should wish this association of ours to make some great effort, and to accomplish something worthy of the town in which we live. The usefulness and dignity of our association depends entirely upon its own members. We have within ourselves the germs of all-conquering power. Honour, like virtue, is an attribute that cannot be laid upon a man or upon a society and be removed like a garment. It must proceed from within the man. It is a product of a high and noble nature. Scientific knowledge, combined with close observation, becomes a light to our path, and opens our eyes to a world which the charlatan never enters. He may practise the Veterinary art, but Veterinary science never, nor would he if he practised a thousand years. It is said that practical wisdom depends entirely upon chance, and is the only thing that can neither be taught nor learned ; that it is a sagacity which would seem infallible, an instinct for truth which cannot err. But I have yet to learn, and would put the question boldly, Why cannot a philosopher or a discoverer develope himself now as in times that are past ? I believe it is in some measure at least referable to a most erroneous and wide-spread notion, that philosophers and discoverers are prodigies, men of giant intellect, and that they accomplish their purpose, or make a discovery, by a simple instinctive effort of their minds, than which nothing can be more erroneous. They are all of them men like unto ourselves, differing only in their ardour ; and it is from their untiring intensity of application that springs up the lovely flower of wisdom. It is not because we have got no men in the present age with the quantity or quality of intellect to make a great man. An example of success occurs to my mind at this moment. A poor lad, seven years old, is seen with axe in hand working in the western forest, clearing the ground in the backwoods of America. Until seventeen years of age he was nothing but a simple farm-labourer, with probably not more than one year's schooling in his whole life. This lad was frequently seen pondering over, and studying by the light of the evening fire, books which he borrowed—he being too poor to buy them. This man, out of his own intellectual resources, his indomitable energy and skill—unlike a Napoleon with a prestige and a name—gradually acquires a name in his own country which becomes a



name above every name ; the greatest and most powerful nation upon the earth elected Abraham Lincoln their president by a larger majority of votes than were ever recorded for any other man before. Thus it would seem his own great natural talents, unswerving honesty, and indomitable industry, has caused his fellow-men to select him to conduct the passage of a great people through a crisis involving the destinies of the whole world. No, there is no lack of material to make discoverers, and no lack of problems wanting solving. It is because there is too much apathy in man. The desire to become one is not sufficiently strong to exact from us that untiring, indomitable application necessary to reach the climax. The secret of our failures is often found in the feebleness of our exertions. Depend upon it, great principles and truths are rarely developed by accident. They are the final results of diligent, patient research, guided by an intelligent mind of a high order. The discovery is simply the climax of a series of long-continued experiments, each landing him a little nearer and nearer to the object he is bent upon gaining possession of. His intense interest induces him to anticipate the lark's first flight as he soars caroling to the skies ; and he is seen prosecuting his researches long after the liquid melodies of the nightingale have died away in the vale. Sir Humphry Davy's magnificent discoveries of the voltaic battery, decomposing earths and alkalies, and his safety-lamp, were the result of many years intense, indefatigable labour, generally until three o'clock in the morning, frequently for whole nights together, night after night. Dr Jenner was twenty-five years diligently prosecuting his inquiries before he finally succeeded. What was the result of his research ? It was the perfecting of a method of vaccination which accomplished a complete revolution in the power of that virulent and fatal disease, small-pox, which carried off one out of every seven persons then born, but which now only carries off seven in every thousand. Would it not be a great national, nay, a universal boon, if these our exertions resulted, during our lifetime, in the cure of the diseases I have alluded to, aye, one-half or one-third of them. Can you suggest a more likely course to accomplish it ? If you can, I conjure you by all that is good and great to make known your plan, and let us step out and espouse it with manly hearts. I verily believe that most of us in this room could become philosophers or discoverers, and accomplish results equal to any that have yet been accomplished, if we would only set about it with the same absolute determination, and be guided by proper judgment. To acquire a knowledge necessary to cure the diseases I have specified, it requires only the same course of conduct as Dr Jenner, and the cures can be achieved. In prosecuting our inquiries, there is probably no human intellect sufficiently sagacious to see its way clearly to the end of the task ; but Provi-

dence may vouchsafe light as it proceeds, and God in his own good time, and by his own wise purposes, will develope the result. It may take one, perhaps two, or even three decades of time to work it out; but I hope yet to hear, before I die, the long, loud ring of triumph's happy shout proclaiming the task is accomplished.

And now, gentlemen, I must bring my address to a close. In doing so allow me to return my warmest thanks for the kind, patient, and attentive hearing you have granted me, ardently wishing the success of the veterinary profession, especially veterinary medical associations. And when life's toils are over, my fervent anxious prayer is that our hereafter may be where there is no night, where all is joy and peace; and, oh! may we meet each other there.

A vote of thanks to the President, for his excellent address, was proposed in a neat speech by Mr Williams of Bradford, Secretary to the Yorkshire Veterinary Medical Society, which was seconded by Mr Lawson, Manchester. The meeting then terminated.

---

## HIGHLAND AND AGRICULTURAL SOCIETY.

---

### THE CATTLE DISEASE PREVENTION BILLS.

A SPECIAL general meeting of the Highland and Agricultural Society was held, on the 16th ult., in the hall of the Society, George IV. Bridge, for the purpose of taking into consideration the Cattle Diseases Prevention Bill, and the Cattle and Meat Importation Bill, at present before Parliament. Lord Rosslyn occupied the chair, and there was a large attendance of members.

The noble CHAIRMAN, in explaining the objects of the meeting, said:—The Directors of the Highland and Agricultural Society have called this meeting, in order that you may have an opportunity of expressing your opinion upon two bills which have been brought into Parliament under the auspices of the Secretary of State for the Home Department. One of them is called the Cattle Diseases Prevention Bill. That bill appeared to the Directors of the Society to be crowded with so many objectionable clauses, that they deemed it necessary to appoint a committee to take the bill into consideration, and to prepare such resolutions as they might deem it expedient to submit to this meeting, with the view, that if you agree with them in their opinion, you might exercise the constitutional privilege of petitioning against the bill in your corporate capacity as the Highland and Agricultural Society of Scotland. That committee accordingly met, and they prepared three resolutions, which I shall have the honour of reading to you, the adoption of which will be moved, and upon which, if you approve of them, a petition will be founded:—1st, “That, whilst this meeting feel that it is most desirable that proper precautions should be taken to prevent the spread of infectious diseases amongst cattle, they decidedly object to committing to servants of shipping and railway companies, or inspectors appointed by local authorities, the power to take such precautions, which appear to be at present more satisfactorily and constitutionally exercised by Her Majesty's Council.” 2d, “That, while this meeting are of opinion that the law should prohibit all traffic in animals suffering under acute and infectious disease, they are of opinion that it would be most inexpedient to extend such prohibition to animals affected by murrains, which disease is of a temporary nature, and



seldom fatal." 3d, "This meeting therefore strongly disapprove of a bill recently introduced into Parliament, entitled 'The Cattle Diseases Prevention Bill,' and that a petition be presented to the House of Commons against it being passed into law, and that the chairman be authorised to sign the same."

Mr HENDERSON, Longniddry, moved the adoption of the resolution.

Mr MELVIN, Bonnington, seconded the adoption of the resolutions. He thought it certainly a singular thing that in the year 1864, when they had been for upwards of thirty years carrying out the principles of Free-trade, they should be going back to the restrictive legislation which was long ago abandoned; and the more so, at a time when grain of all sorts was coming in from other countries, and when foreign merchants might send any kind of grain whether it were sound or diseased, and even though it were filled with fungus. He thought the common law of the country was quite sufficient to meet the case with which they were now dealing. Undoubtedly, these bills were calculated to interfere very much with the trade in cattle throughout the country. It was quite impossible that that trade could be carried on with the proposed restrictions, and it occurred to him that in place of its being called "The Cattle Diseases Prevention Bill," it ought to be called "The Cattle Trade Stoppage Bill." He did not see how they could, under these bills, dispose of their stock at all, when epidemic or epizootic diseases existed in the country. The fines were so large, and the results that would follow from carrying out the provisions of the bill were so serious, that it would be far better for them, rather than incur all these risks, to keep their cattle at home, and consume them there, instead of sending them out to the markets. He did not see how it would be possible to hold such markets as those of Dalkeith, the Falkirk Tryst, and Hallow Fair, under such a system as this bill would introduce. He believed that under this bill penalties would be incurred at these markets amounting to about half-a-million of money. He did not see why they should give their concurrence to any such legislation, and he therefore fully approved of petitioning against these bills.

Mr M'LAGAN, Pumpherston, said that he had heard these resolutions read for the first time, and he was sorry to say that he thought them far too stringent. There were many clauses of these bills that certainly deserved the consideration of the farmers of Scotland. Mr Melvin had said that they ought to depend on the common law of the country for the prevention of disease; but he begged to remind him that they were not at this moment dependent on the common law but on a special enactment to prevent disease, and it was because that enactment would expire in the month of August next that he thought they should seriously consider whether, in any renewed legislation, they should not introduce any of the improvements proposed in the bills now before Parliament. He was glad to say that the Government, and the mover and seconder of the bills, had attempted to meet the farmers of Britain in a very amicable spirit. They had referred the bills to a Select Committee, and he thought that they would be meeting them in the same spirit were they to appoint a select committee to examine the bills more thoroughly, and try to get as much evidence as possible, either for or against them. There was no doubt that when the bills were before the Select Committee evidence would be called for, and he therefore thought the best part the farmers of Scotland could act was to select the gentlemen they thought best qualified to give evidence in regard to the bills. There were many things in the bills which he strongly approved of, and others of which he as strongly disapproved. He approved of the provision that was made for preventing railway companies and steamboat proprietors from overcrowding their trucks or boats employed for the carriage of animals. Such a provision as that was most essential, for he thought one of the great causes conducing to the spread of disease was the overcrowding of vessels and railway trucks. He therefore thought that a clause might be very properly introduced into Parliament on that subject. Another point to which he would allude was



regarding the murrain, which was specially referred to in the resolutions. He knew how difficult it was to legislate in regard to murrain, but there were provisions in reference to it that might be advantageously introduced into any bill. Many parties, for instance, were in the habit of sending forward animals, travelling them on the roads, or putting them on trucks, for being placed in the public markets, when they had scarcely recovered from murrain, and the farmer who bought them, after driving them for six miles or so, found that their hoofs were injured in consequence of their having been previously diseased. He thought legislation would be necessary here to prevent those men who had cattle not completely recovered from murrain, from transporting them from one part of the country to another. He knew that serious losses had occurred from the evil to which he had referred, and the legislature had given power to the Society for the Prevention of Cruelty to Animals to get any person punished who drove animals in that state. Much had been said about the heavy penalties that would be incurred at large markets under this bill; but the fact was, that if they had a bill like this, they would not have such centres of disease as they had had of late years. They must consider, in the first place, that this bill prevented any man sending diseased cattle in railway trucks and steamboats; and, in the next place, there was to be an inspection before animals were put in show-yards. Now, at Hallow Fair last year, and the year before, if, as Mr Melvin had said, there would have been L.500,000 imposed by such a bill, as penalties on parties showing cattle, he was sure L.1,000,000 were lost by farmers who bought cattle there. He spoke from experience here. He still maintained that the loss to farmers was far greater than what would accrue from imposing penalties. He had himself bought several cattle at the Hallow Fairs, which he thought were perfectly sound, but which turned out not to be so, and he lost L.3 a-head on them. Then it must be remembered the great loss that accrued to dairy farmers by cattle that had been affected by murrain being placed near their cows. These points were worthy of serious consideration, and therefore he thought they should not be too rash in condemning these bills *in toto*. He was not prepared to move an amendment at present on the resolutions, but he was anxious that they should meet the Government in a proper spirit, and, instead of condemning the bills as a whole, appoint a committee to consider them, and see whether they could not be so improved as to make them acceptable to the farmers of Scotland.

Mr SWAN (cattle-agent) quite disagreed with Mr M'Lagan with regard to driving cattle to the market. He was in Darlington on Monday last, and was bound to say that at least two-thirds of the cattle there were affected with murrain; and how could any man be stopped driving these cattle five or six miles along the road to the nearest station? He told those to whom he sold them that they would be under murrain. He did not see that the Legislature could make laws to interfere with it, because, if kindly dealt with, cattle in that condition soon get over it. A gentleman had just bought from him a lot of cattle affected with murrain, and when he was told of their state he replied, that if he was allowed a deduction for eight or ten days' feed he was not afraid of the murrain. Mr Swan concluded by stating that there were many clauses of the bill to which nobody would object, especially the provisions against the over-crowding of steamboats, and in favour of the cleaning of railway waggons; but that it would be dangerous to interfere with cattle in the wholesale manner proposed in the bill.

Professor GAMGEE next rose and said—The extraordinary prevalence of this disease in this country since the free importation of foreign stock has led repeatedly to inquiries of various kinds as to the best means of preventing that disease. I have had the honour of reporting on this subject, and, so far as I am aware, not a single fact I have adduced has ever been disputed. I now come to this meeting, and I hear Mr Melvin—who has constantly, I believe, opposed the measures for the prevention of disease, such as are now before the House—declare that maladies are so rife that we have markets where positively the penal-



ties to be inflicted would amount to about half a million of money. I think, therefore, it will be impossible henceforth to declare that we have not a serious amount of disease in the United Kingdom. Since 1842, the mortality in this country has doubled, trebled, quadrupled, and I have the testimony of Mr M'Minn—a gentleman of the largest experience as an insurance agent—who will confirm me when I say that fifty per cent. of that mortality is due to contagious and preventible diseases. I hold that, in these circumstances, this Highland and Agricultural Society of Scotland, with the great influence which it possesses, is placing itself in a false position by the resolutions now proposed. With these resolutions before you for adoption, you are acting contrary to the manner in which agricultural associations of the most enlightened kind have acted in Europe and other parts of the world. Indeed, when I come to analyse the manner in which farmers themselves legislate on this subject, I find that they go a great deal further than professional men, or than the Government would dare to do. If farmers believe that they are to be coerced and tyrannised over by this measure, let them represent their case to the public, and I am sure there is not a single Briton who will dare to coerce his fellow-man. But we are in this position; disease has entered into your stock, and you refuse to adopt any measures to prevent it. You say, "I will not be the loser, at all events, for I will sell them to my neighbours to lose by them." That has been repeated to me, from week to week, by the best men in Scotland. Cries of "Name, name," and "No, no.") It is impossible to name them. (Renewed cries of "Name, name.") I repeat—"Name, name," and some confusion)—gentlemen, what is a matter of every-day experience, what occurs constantly. I cannot, with regard to this matter, individualise any person, because it would be quite impossible to do so. (Renewed and general cries of "Name, name.") I could name twenty, thirty, fifty.

A VOICE.—Give us one name.

Mr HUNTER, of Thurston, here rose and said—I beg to give my name as one.

Professor GAMGEE continued—I have gone through the whole of this discussion, and I have had fourteen years' experience of work in connection with this traffic in diseased animals, and I know perfectly well what has been done by men who, in other transactions of life, would never dare to do the same kind of thing. For example, last year pleuro-pneumonia existed in a farmer's stock, and to replace his losses he kept on buying, and disposed of the unsound animals by auction sale. The disease appeared among them this year. I met this gentleman in London, and spoke to him about the prevention of pleuro-pneumonia. He distributed his stock upon three farms. We went out, and we stopped the disease in a week. There is a laugh and a titter; but I am ready to stake my reputation on this, that I will arrest pleuro-pneumonia, or any other of the contagious diseases to which these bills have reference, within three weeks. I am ready to do it at any time; and within ten days I will prevent any further contagion either from pleuro-pneumonia, murrain, or small-pox in sheep. If, as an Agricultural Association, you stand forward to consider how human food is to be kept untarnished, you will then meet the country in a proper temper; but if you stand up for no inquiry, no prevention of disease, no legislation, the Society will be placing itself in a false position.

Mr BALFOUR, Milton, said, that even according to Professor Gamgee's own statement they required no bills—all that they required to do for the prevention of disease apparently was to put their stock in his hands. After some remarks as to Mr Gamgee's scale of charges for the treatment of diseased cattle

Sir JOHN DON WAUCHOPE said, he perfectly agreed with every word that had dropped from Mr M'Lagan. He thought that legislation on these subjects was necessary, and he could quite corroborate what Mr M'Lagan had said about the injury done to dairy stock by the murrain. The seconder of the resolution had spoken about this being an interference with free-trade. He supposed that



gentleman was the only person who imagined anything of the kind. The great object of the bill was, that Free-trade measures might have full force and benefit—that was to say, that the cattle imported might be beneficial to the country, instead of proving an injury and a loss as they had done. They knew from facts that immense loss had occurred since diseased cattle had been imported. He had heard it stated—he could not say whether he was correct or not—that for every animal that had been imported, five in the country had died. If such was the case, was it not necessary that they should take active steps to render the Free-trade legislation beneficial to the country, and to secure that the cattle imported would really have the desired effect of cheapening the food of the people? It was very common now-a-days to object to measures which were brought forward; but a great number of those objectors had neither the courage, energy, nor capacity to propose any measure themselves. He quite concurred with Mr M'Lagan in the remarks which he had made; and he thought it would be a very great pity were the Highland and Agricultural Society to go forward and petition against these bills without proposing something in lieu of them.

Mr HARVEY, Whittingham Mains, said, it appeared to him that there had been an immense flourish of trumpets on this subject, on the supposition that to-morrow the measure was to be thrust down their throats. That was not the fact. On the authority of a letter from Lord Elcho, he learned that while the bill was to be read before the House that night, the Under Secretary for the Home Department had stated, that it was to be read *pro forma* only for the purpose of being sent to a Select Committee, and that therefore there would be ample time for lodging their remonstrances against it. He saw no reason for the Society getting frightened on the subject; and he would therefore propose that they should send a deputation to London to protect their interest in the matter, when the Bill came before the Select Committee. He thought some legislation was quite necessary, especially as to clearing railway trucks, and leaving cattle standing at railway stations.

The Earl of ROSLYN suggested that, in order to meet the views of Mr M'Lagan, Mr Harvey, and other gentlemen, they should agree to petition against the bill in its present shape. It was certainly the interest of the farmer to support any measure which would check the spread of infectious disease, whether that measure came from Mr Gamgee or any one else; but he should not like any bill which left it to railway servants to pronounce that their cattle were diseased, or which opened any new door for vexatious litigation; and he also disliked the arbitrary interference of cattle-inspectors, and objected to the county rates being burdened with their salaries.

Mr HARVEY said, his Lordship's proposal met his view.

Mr M'LAGAN then submitted an amendment in the following terms:—"That as there are certain clauses in the bills calculated to be of much benefit to the agriculturists of Scotland, and a Select Committee of the House of Commons is appointed to consider these bills, that a committee of this Society be appointed to collect evidence to submit to that Select Committee with regard to the prejudicial clauses."

Professor BALFOUR expressed his opinion, that the amendment of the resolution by the Chairman sufficiently gained the object in view by Mr M'Lagan's amendment.

Mr MOWBRAY, Cambus, suggested the appointment of a committee to watch over the bills.

Mr DURIE, Barney Mains, did not see a single clause in the bill that would be beneficial to the farmers, and he thought the Society should go forward as one man against the bill, which had been originated by some old women of both sexes—assisted by some noisy veterinary surgeons who wanted a job.

The Earl of ROSSLYN said, he might state that the Directors had authorised the Secretary to proceed to London to communicate with the Scotch members, and take such measures as they might recommend in order to secure the bill



being set to a Select Committee. I believe the Government have consented to allow it to be sent to a Select Committee ; and the Directors had also had under consideration the propriety of sending up a number of gentlemen from the Society at large to watch over their interests, and give any evidence which might be necessary.

Professor GAMGEE begged to state, that the proposal for a Select Committee came from Mr Bruce, and that that had been agreed to long before Mr Hall Maxwell went to London. It entirely emanated from the Government, because they felt it to be a measure of such importance that it should not be hurriedly gone on with. At the very outset, when he had a word of advice to give on the matter, he told the Government they should take the farmers along with them, yet he had been represented by the writings and speeches of various persons, as if he were in antagonism to the agricultural interest. He would tell them that, ten years after this, when he was dead and gone, they would see that he had been their best friend.

Mr J. B. NICOLSON said—I came here expecting we were to discuss the question fully as to whether these bills should be passed into laws. I find, however, that there is a question which has excited still more discussion than the merits of the bills—namely, the powers of the gentleman who has just sat down. He has avowed his power by a word, as if he were a magician, to scatter to the winds the pleuro-pneumonia which affects our cattle. We also find, by the avowal he has just made, that, in addition to his power as a magician, he also holds the strings of Government. (Professor Gamgee—Not at all.) I wondered, I confess, from whence these bills had come. I confess I am in ignorance no longer. I have no doubt whatever now of the source from which these measures have come, and therefore I am very much assisted in the consideration which I shall give to them. Gentlemen, if these bills had come from a totally unprejudiced source, I should have given to them a much more lenient and favourable consideration than I fear we shall be able to do, knowing the source from which they have come. Professor Gamgee finds it necessary to stand up and avow that he is not the enemy of the farmers of Scotland ; why, gentlemen, if he had not made that statement, I should have said that these bills did not proceed from a friend, but from an enemy of the farmers of Scotland. But more than this, I should also say they proceed from one who is quite disposed to ignore the interests of the public. Gentlemen, in the existing measures on this subject—which, it occurs to me, has been very much overlooked in the discussion—I find provisions in the interest of the public which are totally omitted from the bill we are now considering. I find in the 3d clause of the Act 11 and 12 Vict., c. 107, which, with Acts 16 and 17 Vict., and succeeding acts, form the existing law upon the subject—I find most distinct and precise regulations preventing the exposure of diseased meat in the markets. Now, I have read carefully the present bill, and it seems to me there are no provisions in it making any regulations whatever regarding the exposure of meat in market. Now, gentlemen, the question of the sale of living animals is one more belonging to the farmers than to the public ; but there can be no doubt that the paramount interest of the public is in the question of the sale or exposure of unwholesome meat ; and I think those who profess to be amending the law in the measure before us ought to have taken good care that at all events those regulations, which the public now have for their protection and benefit, were not omitted. There are two ways in which the regulations for the importation of cattle and for the prevention of disease in cattle, might have been gone about. Powers might be given to the Queen in Council in regard to these matters, or they might have a precise statute setting forth each particular regulation. At present the matter stands on the footing of giving power to the Queen in Council ; the bill now before us proceeds on the principle of embodying within the four corners of an act of Parliament all the provisions which are necessary in this matter. Now, I put it to you, knowing how very much public and scientific opinion varies in regard to the best means for making regulations on this subject, whether it is not better to commit the power of



making regulations to her Majesty in Council, rather than put them into a statute. Is it not far better that it should be in the power of the Crown, on the advice of scientific persons taken into counsel on the matter—and I should not in the least object to Professor Gamgee being one of the number, if her Majesty should think proper—the making of such regulations as the emergency of the case might require? Suppose that next year we should be visited by an epidemic with which at present we are totally unacquainted, would it not be far better that the Queen in Council should have the power of issuing regulations applicable to the circumstances. Mr M'Lagan says, it is very proper there should be regulations in regard to the cleaning of cattle trucks and ships, and I entirely agree with him on the subject; but when I tell you that, beyond all doubt, the power at present rests with the Queen in Council to make such regulations, the proper course would therefore be for those who feel an interest in this matter to bring the subject under the attention of the Privy Council; and I am quite sure the Queen, under the advice she would receive, would at once make the necessary regulations. As to the present bill, I need only ask your attention to one or two of its clauses. By one clause it is provided that if any person should turn out a diseased animal on any unenclosed land he should be subject to a penalty of L.20; so that if any of you should leave out on a moor in Inverness-shire a sheep touched with the scab, or any cattle attacked by murrain, you will be fined L.20—an absurdity which I take as an illustration of the manner in which the whole bill has been concocted, which shows an utter ignorance of the proper principles on which such a bill should be formed. Now, look to the 14th clause, which provides that any railway, canal, or other company, or common carrier, may refuse to carry and prohibit entering on their premises any cattle that, in the opinion of the officer of the company, or of any carrier or any servant of his, is diseased. What would the effect of such a clause be? Suppose Mr Swan goes and buys, at the extremity of the new Highland railway, a herd of cattle or a flock of sheep, and has to deliver them in the south of Scotland or in England, and that he takes them to a remote station on the line. In that case, any Highland porter, who cannot speak a word of English, and who knows nothing of any distinction between the kinds of diseases in animals, or who might be acted upon or bribed by others having an adverse interest, may refuse to allow the cattle to go on, and Mr Swan would be unable to help himself. Then, in regard to cattle-inspectors, you will not be surprised that there are ample provisions in the bill for payment of their salaries, a matter which does not affect the farmers so much as another class of members of this Society. In the case of the dues not being sufficient, it is provided that the salaries of the inspectors shall be paid from the county rates; and I daresay you will agree in thinking that already there are sufficient burdens laid upon the land, and that the land will not receive any very great benefit from the creation of a host of cattle-inspectors to compensate for this additional charge on the county rates. Mr Nicolson concluded by saying that he was now acting in this matter for Mr Hall Maxwell, who had gone to London to attend to the interests of the Society in reference to these bills. He believed there was no doubt of the intention of the Government to refer the bills to a Select Committee; but he thought the proper course for them to take was to adopt the resolutions which had been proposed, with the alteration which had been suggested by Lord Rosslyn, thus taking up a strong attitude against the bill in its present shape.

Professor GAMGEE, after remarking that Mr Hall Maxwell had certainly left an admirable substitute to plead his cause, said he wished to explain that in this bill the two principles were included of having an open act of Parliament within four pages, and empowering her Majesty in Council to institute regulations. It so happened that, by the provision contained in Part II., clause 7, her Majesty had power, by an Order in Council, to make regulations, and might from time to time, by a like Order in Council, revoke or modify subsisting regulations, or make new regulations in addition to, or as substitutes for, any existing regulation or regulations. The gentleman who had sat down said that



there ought to have been some provision in the bill to check the traffic in unwholesome meat. It so happened that Government had taken great care to do so before Parliament closed last year. A clause was added to the Nuisance Removal Act for England, and there was full power given in the Police (Scotland) Act to seize everything in the shape of unwholesome meat; and he fully expected that the next step to be taken was to do something to prevent the spread of disease. With regard to the insinuations that had been thrown out against him, everybody well knew the very delicate position in which he was placed, not by his own free will, but by circumstances. He had been obliged to do his duty, and he hoped everybody would agree that he had done it to the best of his ability.

After a few remarks from Mr MELVIN, the vote was taken by a show of hands, when the resolutions, with the addition of the words suggested by Lord Rosslyn, were adopted by a very large majority. It was agreed to forward the petition on the subject to Lord Dalkeith for presentation.

The CHAIRMAN then submitted the following resolution on the subject of the Cattle Importation Bill:—"That this meeting is of opinion that the bill recently introduced into Parliament for the purpose of regulating the importation of diseased cattle into the United Kingdom is quite unnecessary, and should be withdrawn, the existing act, 11 and 12 Vict., c. 105, being amply sufficient for that purpose; that a petition against the bill be presented to the House of Commons; and that the Chairman be authorised to sign the same."

On the motion of Mr HENDERSON of Longniddry, seconded by Mr GLENDINNING of Ratho, the resolution was unanimously adopted, and it was agreed to forward a petition against the bill to the Earl of Dalkeith for presentation.

On the motion of Mr PRENTICE, Strathore, a vote of thanks was tendered to Lord Rosslyn for presiding.

---

## PERISCOPE.

---

### CATTLE DESEASES PREVENTION BILL.

IN the House of Commons, on Wednesday 9th March, Mr BRUCE, in moving the second reading of the Cattle Diseases Prevention Bill, stated that in the United Kingdom there were about 8,000,000 cattle, 40,000,000 sheep, and 4,300,000 pigs, and the aggregate value was about £120,000,000 sterling. Assurance offices for cattle were started in the year 1844, but notwithstanding that the premiums had been increased from time to time, they had found the business unprofitable, and they had accordingly ceased operations. During six years for which he had obtained returns, the average annual loss of cattle, sheep, and pigs by disease amounted in value to six millions sterling. The most fatal disease to which cattle were subject was pneumonia. With respect to horses, the doctors disagreed as to the cause of the disease, and as to the manner of its propagation. There was, however, he believed, a strong preponderance of authority in favour of its being contagious, although it might also arise as an epidemic. There could be no doubt that it was transmitted by the passage of cattle in ships and railway trains from Ireland and Scotland. The disease was propagated both from the ships and trucks in which diseased cattle were conveyed, from the treatment to which they were subject, and from the other breeds with which they came in contact. The annual amount of loss from cattle-disease was five per cent., in addition to which the cattle that did not die were materi-



ally weakened and became unfit for human food. It was, he believed, partly owing to this cause that the price of cattle had risen so greatly within the last few years, and that so enormous a quantity of diseased meat was sold to the public. Professor Gamgee had shown that out of 1839 cows kept in certain dairies in Edinburgh 1075 were diseased, and that of that number 791 were sold to butchers. A similar state of things prevailed in London, Manchester, and other great cities. It was calculated by the same Professor that in Edinburgh 200 or 300 diseased cattle were sold every week. Then came the important question, Whether the use of diseased meat affected injuriously the human frame? No very clear answer could be given to this question, but there was evidence to show that under some circumstances the use of such meat did create disease. It was observed by Dr Letheby as very remarkable, that boils and carbuncles had been very prevalent of late years, and he believed that to a very great extent they were caused by the use of diseased meat. Whether all diseased meat was, or was not, of a poisonous character, it was certainly not nutritive, and the evil caused by the sale of diseased meat did not fall upon the rich, but upon the poor, who of all others most required wholesome and nourishing food. Such being the case, it now became his duty to allude to the existing legislation on the subject. There could be no doubt that disease was propagated by the importation of diseased cattle. Foreign cattle, as a rule, arrived in this country in a better condition than cattle from Scotland or Ireland, and the Cattle Importation Act, 11 and 12 Vict., was held to apply only to cattle imported from foreign countries. It had been suggested that the proper remedy was to send agents to the port of export, and there stop the exportation of diseased cattle; but he had ascertained on inquiry that great loss and inconvenience would arise from the adoption of such a course, as entire droves of cattle would be delayed, and their owners would thereby lose the market for which the cattle were intended. Nor would it be an effectual remedy, as disease usually showed itself after the arrival of the cattle in this country. It was his intention to move, at the proper time, that the bill should be referred to a Select Committee, and whatever additional suggestions they should make with a view to rendering the bill more effective, he would gladly adopt. The statutes 11 and 12, and 16 and 17 Vict., related to the prevention of the importation of diseased cattle, sheep, and horses, and the present bill would consolidate those statutes and extend the existing law. It provided penalties for the offence of turning diseased cattle amongst cattle which were not diseased; for exposing diseased cattle for sale; for exporting diseased cattle, and for driving such along roads without proper precautions. The bill provided, with respect to the transport of cattle from the country, that they should receive water once in the twelve hours. The 11 and 12 Vict., provided for the seizure of diseased lambs and sheep exposed for sale by authorised inspectors. The present bill extended that provision to all kinds of cattle. There was also a clause repealing existing acts, and these with the schedule completed the measure. He was fully aware of the difficulty and delicacy of the task he had undertaken. But he had proved the existence of a great evil, and they ought not to be content till they had provided such a remedy for it as it was in the power of legislation to supply. He now moved that the bill be read a second time.

Mr PACKE said the hon. gentleman had drawn a melancholy picture of the diseases of cattle in this country. He believed this was mainly owing to the importation of cattle from foreign ports. Whatever benefit in other respects the country had derived from a Free-trade policy, diseases of cattle in England were not known before the measures of 1844. Not only farmers and graziers, but consumers, suffered from these diseases. It was true that the price of beef and mutton was high, but the price of pork was extremely low. The foot-and-mouth-disease had a very deleterious effect on cattle, though it was not so dangerous as pleuro-pneumonia and other diseases. The diseased cattle should be prevented from being brought to fairs.

Mr CAIRD believed that the diseases of cattle were very much owing to



the artificial mode in which they were fed and kept, which had a tendency to develop disease in the whole system. To that circumstance, more than to the introduction of foreign cattle, might be attributed the spread of disease. It was stated that very few animals were brought to market which might not be said to be partially diseased. Notwithstanding what the hon. gentleman said of the consequences of eating diseased meat, he believed the returns of the assurance societies proved that there was a higher standard of health now than formerly. The hon. gentleman began his speech with Mr Gamgee; Mr Gamgee was in the middle of it and at the end of it; but if the bill passed in its present shape, it would prevent the holding of fairs in any part of the country. The foot-and-mouth-disease was one which passed off in the course of a week, and to affix such a penalty as the bill proposed for exposing cattle affected by that disease showed that the framer of it had no practical knowledge of the subject. He hoped that a distinction would be made between stall markets and food markets, for there was great difference between the two. Cattle might be sent from Scotland or Ireland which at the time they were sent were free from disease, but which might have contracted disease from exposure on the way to market; and it would be hard to make the owner liable for a disease so contracted. He hoped the bill might be made efficient in the Select Committee. The question was one which deserved patient inquiry.

Mr NEWDEGATE heard the statement of the hon. gentleman opposite with great pleasure, but he thought it rather highly coloured. He was also disposed to agree with some of the remarks made by the hon. gentlemen who spoke last. He was afraid that the inspection might be too inquisitorial in its character, and to obviate that he would suggest the appointment of licensed persons, who would be responsible for their acts.

Mr HOLLAND said that there was no communication with Mr Gamgee as to the bringing in of the bill; and as to the bill of last year, which he (Mr Holland) introduced, it originated with himself and not with Mr Gamgee. He could inform the hon. member for Leicestershire that there was greater mortality amongst cattle before the Free-trade measures of 1844 than since that time. He could refer him to the murrain, which existed about the middle of last century, which was so severe that it was alluded to in the speech of the Sovereign. Great care should be bestowed in the selection of inspectors. At present they were generally broken-down tradesmen, and unfit for the situation. Were it otherwise, the disease in cattle would not spread so widely. The inspectors ought to be members of the veterinary art. There had sprung up an established trade of butchers who would be ruined if they were compelled to deal in cattle that were not diseased. But the public should be protected from the evils arising from the use of diseased meat, and he hoped this could be accomplished without interfering with legitimate trade.

Major HAMILTON hoped the Highland Society would have an opportunity of being heard before the Select Committee.

Mr Alderman SALOMONS said that a very large trade in diseased meat was carried on in London, although the Corporation were most anxious to suppress it. But owing to the defective state of the law it was extremely difficult to make it reach all the parties who were concerned in sending diseased meat to market.

Sir W. MILES congratulated the hon. gentleman opposite on the introduction of these two bills. The subject was a difficult one to deal with, but he believed that the origin of the evil complained of was to be traced to the condition of the cattle sent from the Continent. He hoped that the Select Committee would hear evidence from all parts, and more particularly from Wiltshire. He was sorry that the foot-and-mouth-disease was inserted in the schedule. He had himself brought some Kerrys from Ireland. Those which were brought over separate had no disease, those that were brought together had.

Mr PAGET could not agree with those who thought the foot-and-mouth-disease was not a serious disease. He would gladly give L.150 to be free from it in the small farm which he held.



Sir M. S. STEWART said that the farmers in the east of Scotland doubted if the bill would be workable in its present shape, but he hoped it might be improved in committee.

Mr HENLEY hoped it was fully understood that evidence would be allowed to be taken. The hon. gentleman stated that a fifth or sixth of the meat sold was diseased, and he quoted figures which were so like those of Mr Gamgee, that it was natural to suppose he quoted from that gentleman. If the evil originated with the foreign cattle, the most effectual way to stop it was to prevent them from coming at all. But, then, how were we to get at the knowledge of the disease? He believed the origin of disease could only be discovered by auscultation, and how was a person to apply the stethoscope in the midst of a lot of wild bullocks?

The bill was then read a second time and ordered to be referred to a Select Committee.

---

## PREVENTION OF CATTLE DISEASE.

*(From the Scottish Farmer, March 16, 1864.)*

It is a long time since any question in the agricultural world caused so much excitement as the bills at present before Parliament for the prevention of disease among animals. Usually, farmers are a class difficult to move; but on the present occasion they have exhibited an energy with which they can rarely be credited, and a unanimity which is very far from common among them. That the bills which have aroused them, or at least one of the bills, would, if carried out in its integrity (and though it is proverbially easy, it is certainly not prudent, to take it for granted that a coach-and-four might be driven through its provisions as soon as it becomes an Act of Parliament), materially interfere with the trade in live stock, there can be no doubt; but still we are inclined to think that farmers in this matter have been a little too easily frightened, chiefly from having too much mixed up persons with principles.

It appears to us a matter of very little moment as to who is the originator of a measure containing elements of good in it; and it is equally inconsequential who is at the bottom of it if the measure is bad. In the one case, the bill ought to meet with the support of the farmers; in the other, it should have their strenuous opposition. We regret to notice, however, that in almost all the discussions which have taken place upon the bills now under the consideration of a Select Committee of the House of Commons, the authorship has been much more canvassed than the bills themselves, and that that which is undeniably good in them has been rejected because a certain person is supposed to have had a hand in drawing them up. We really do not think that this is a dignified or at all a strong position for any individual farmer, far less for a great and influential body like the Highland Society, to take up; and we are persuaded that if the Secretary, Mr Hall Maxwell, had been present, he would have seen and rebuked the injudiciousness of some of the speakers at the meeting last week.

We believe all farmers, and many of the principal cattle-salesmen and agents, agree in thinking that it would be greatly to the advantage of themselves and the community at large if an Act which should tend to prevent the spread of disease, and which at the same time should not unduly and harshly interfere with the operations of trade, could be introduced. But we are quite sure that the great majority entirely disapprove of, because they are fully aware of, the unworkableness of many of the clauses in the present Cattle Diseases Prevention Bill—at all events, so long as the foot-and-mouth-disease is included in the schedule. All who have been in the habit of attending our large cattle fairs and trysts know well that a large proportion of the animals sent in to these



markets are affected with murrain. They are also well aware that in all probability these animals were quite free from disease when they left their homes in the north or the south, but have been unfortunate enough to catch it by the way. By the time they arrive at the markets at which they are to be disposed of, their owners know they are suffering from murrain, so do all people who are likely to purchase them; but if they sell or offer them for sale they are liable to a penalty of L.20 for every offence, which may mean, so far as we can understand the bill, L.20 for every beast, which is of course often a great deal more than the whole value of the animal. But this is not the worst. The owners cannot take their animals back to their homesteads without incurring additional penalties and expenses. For instance, in one of the sub-sections of clause 7th, "the purification of any yard, stable, out-house, *or other place* in which diseased cattle may have been confined, *or over which they may have passed*, and of any cart, waggon, truck, vessel, boat, or other vehicle in which they may have been carried," is rendered imperative. Now, just imagine a flockmaster who has started with a sound flock from Sutherlandshire, but which has caught contagion on the road, forced to return with his sheep, and then distribute disinfectant fluid along the whole line of travel from his home to Falkirk Tryst! The thing is in the last degree absurd; and yet it is what the strict letter of the bill demands. That foot-and-mouth-disease is one which cannot well be legislated upon with advantage seems to us pretty clear from the fact that in show-yards, such as the Royal English Society, the Highland Society, and the International Society at Hamburg, where the most choice and healthy animals are shown, and only admitted after the most careful inspection (at the latter place extraordinary precautions were taken), this affection almost inevitably shows itself in the course of a few days. Then, that clause which gives railway porters—many of whom, we make bold to say, scarcely know the meaning of the word contagion—the power to decide as to whether animals brought for transit are diseased or not, is clearly an outrage upon common sense.

Having said this much against the bill, we are bound to say, along with Mr M'Lagan of Pumpherston, and Sir John Don Wauchope, that we think there are several good things in it which deserve the approval and support of the farmers of Scotland. There are the clauses providing for the purifying of cattle trucks on railways and the cleaning of boats, the neglect of which, along with overcrowding, undoubtedly tends very much to the continuance and spread of disease among our stock. The inattention to the comfort of animals on a long railway journey, which this bill provides against, is also conducive to their deterioration and illness. We cannot but regret, therefore, that Mr M'Lagan's motion counselling co-operation by a committee of the Highland Society with the Select Committee of the House of Commons, with a view to lessen disease without injuring stock-owners, was not adopted instead of the merely negative resolution of opposing the bill in its present shape. But although Mr M'Lagan was not successful in carrying his motion, his opposition had the effect of securing an important modification in the resolutions submitted to the Society.

The legal gentleman who, in the absence of Mr Hall Maxwell, was specially retained for the defence of the course the Directors had resolved to pursue, was certainly more telling than tasteful in his address. No doubt the practice of the bar allows a freedom of language towards opponents, unknown in other controversial arenas, but Mr Nicolson, we are inclined to believe, even exceeded the licence of the law courts. We are not going to deny that Professor Gamgee laid himself open to attack, but that need not have been ill-mannered and rude. To be witty it is not necessary to be vulgar; and it was surely unwise to scarify "vain-glory" at the sacrifice of gentlemanliness—the more so as Mr Nicolson himself was not quite free from the boastfulness he condemned. For, professing to have a thorough knowledge of the old Act, he ascribed to it powers which everybody knows have at least never been exercised under it, and quoted and denounced a clause from the new bill which is word



for word transcribed from the old ! Altogether, Mr Nicolson's was a speech designed to injure an opposing counsel rather than to promote the true interests of the farmers.

Then the talk about this bill interfering with free-trade is perfect nonsense. Free-trade was never intended to give any one a prescriptive right to deal in that which is prejudicial to the community. There is no analogy whatever between damaged wheat and diseased cattle. The one, if sent from abroad to these shores, can never affect the sound cereals of the British farmer ; the other may work havoc among his healthy stock. It was asked, we see, at Haddington, why farmers could not be allowed to carry on business in their own way ? For the simple reason, that in civilised and well governed nations no class of persons are allowed to carry on business in their own way, if that way is inimical to the interests of their neighbours. And, what is more restrictive still perhaps, no man in this country is permitted to attempt injury even on himself without being liable to punishment.

We are glad, however, to learn, on the authority of the *Mark Lane Express*, which seems to have had private information in the matter, that the foot-and-mouth clauses will not be persevered with. The most obnoxious portions of the bill are thus done away with ; and we trust that the farmers in this country will now cordially co-operate with Government to secure a law which shall, with the least possible amount of annoyance and loss, prevent the spread of the more fatal diseases among sheep and cattle, and the great losses consequent thereon.

## WILLIAM HARLEY AND HIS DAIRY SYSTEM.

(*Concluded from last Number.*)

(*From the Journal of Agriculture, January 1864.*)

THE Willow Bank cowhouse, as we have mentioned, soon attracted, from the novelty of its plan, and the perfection of the system, a large amount of public attention. In fact, it drew such a number of visitors as to seriously inconvenience the servants, and annoy the cows by disturbing them. This the proprietor was loth to allow, but he was equally loth to turn visitors away. His ever-ready brain was not long in devising a method by which his establishment could be seen, and yet neither servants nor animals be troubled. The plan was certainly a curious one. He gave "*directions for erecting a balcony in the new cowhouse, from which a bird's-eye view of the whole interior of the cowhouse and its hundred cows could be obtained at one glance*" [the italics are Harley's own], without producing the slightest annoyance or inconvenience either to the servants or cattle. In constructing this improvement the proprietor was induced, for various reasons, to study effect ; the chief object, however, was to gratify the numerous spectators, whose frequent visits had now become highly excited. The balcony was therefore erected on the outside of the building, opposite to the main passage ; it was about four feet above the level of the floor, and open in front to the cowhouse, where a large curtain was suspended. Visitors, on their arrival, were requested to insert their names and place of residence in an album kept for that purpose. The keeper then, by means of a pulley, drew aside the curtain, when the whole establishment, with its hundred cows and their attendants, were instantly presented to the view of the delighted and astonished spectators. Princes, noblemen, and gentlemen, from almost every quarter of the globe, bore testimony to this interesting panorama. All, indeed, were charmed with the order and arrangement observed in the plan, and uniformly lauded it as unrivalled both in execution and design. After the balcony had been erected, the Harleian cowhouse became, as it were, one of the 'lions' of the day. In fact to visit it occasionally became



the fashion of the town ; and the author, to gratify the desire that prevailed, had copperplate tickets of admision engraved, with a design symbolical of a woman milking a cow, and groups of children drinking milk, under the Glasgow Arms. These tickets were adapted for the admission of any number from one to six. The admission was fixed at one shilling each, which actually produced about L.200 per annum." Here, again, we see the business, money-making habit of Harley cropping out. Besides the people who had to pay for admission, and which, at the high charge of a shilling each, would reach 4000, there were a large number, friends of the proprietor and his friends' friends, admitted to the cow-exhibition free.

The same excellent judgment which arranged the cowhouse was also displayed in the formation of the milkhouse. To the east of the cowhouse there was a deep ravine, with a small stream flowing through it. This was arched over ; and one of the arches, 45 feet long, 12 wide, and 12 high, from the floor to the centre of the arch, was formed into the milkhouse, the side-walls being 6 feet high. The entrance was from the north ; and a large window in the south end, covered with a fine wirecloth, afforded light ; while five circular openings in the centre arch, also covered with wirecloth, served to admit light and air. The side-walls and roof were lathed and plastered, 6 inches being left between the stone-work and the plaster for the free circulation of air behind the plaster, and openings, covered with wirecloth, were placed at intervals to admit of the air playing through the whole building. The floor was of polished ashlar, and had an inclination, from the entrance to the extremity, sufficient to admit a flow of water through it into a cesspool beneath. At the north end was a pipe, by which water in the rivulet, over which the milkhouse was built, could be turned into the room. The milk-dishes were placed on the pavement along both sides of the building, and were usually filled with milk to the depth of three or four inches. When the vessels were filled with milk, the cesspool at the south end was plugged up, and the water at the north end let on, until it sufficiently covered the floor where the milk-dishes stood. " This cooled the house ; and the fixed air, or the spring of the water, carried up the steam of the milk through the circular openings in the top of the arch." When the dairymaid went to cream the milk, the cesspool was opened, and the water allowed to run off. The place was kept scrupulously clean, the floor, besides being constantly flooded in the way mentioned, being regularly washed and rubbed with a dry cloth. This, with the free ventilation of air through the premises, insured that the atmosphere was always pure and sweet. In order to make the circulation of air more effectual, a tunnel, about a foot square, was conveyed under the street along the top of the arch, and two transverse tunnels crossed and communicated with the central one in the middle of the house—that is, they were carried from the sunk area on the south to the north side of the building. There were strong wire-gratings put at the mouth of these tunnels to prevent vermin getting in. It was not necessary, however, to devise any plan for keeping out flies from the milkhouse, as it was remarked whenever they got in by accident they did not survive, owing to the coldness and rarefaction of the place. Modern dairy-keepers have yet a great deal to learn in the way of cleanliness and ventilation from old Harley.

Mr Harley had a steam-engine for churning, thrashing, slicing turnips and potatoes ; and, even so early in the history of agricultural implements for the economising of food, he had a chaff-cutter and a corn-bruise. The servants' duties were very methodically arranged ; indeed, but for his thorough systematicness, Harley could never have managed half the things he undertook. At half-past four in the morning the watchman, who was stationed on the premises all night, and who examined the cows in the byre every half-hour to see that nothing was going wrong, rang the bell for the servants, who assembled at five. The byremen, or cowfeeders, having lighted the gas, for by such means was the establishment lighted, proceeded to tidy up the cows' bedding, and *clawt* the dung into the groove. This done, all hands assisted in carrying in the



mash or soft provender for the cows, the byremen giving the dry provender. The milkers, chiefly women, each of whom had from twelve to fifteen cows to milk, proceeded to their work. Each was furnished with a milking-pail, a large tin vessel for receiving the milk of the whole lot, and a towel and stool. Every two milkers had a pail between them for washing their hands and the cows' udders, which they took charge of on alternate days. A mop was also provided them for washing the floor. At eleven o'clock the byremen gathered up the clean straw which had been laid down in the morning; the milkers, having assisted in giving the soft food, then cleaned and curried their respective lots of cattle. Then dry food was given, and the beds relaid by the byremen, and the place was shut up until three, when the operations of feeding and milking, as in the morning, were repeated, and the place was once more shut until seven p.m. At that hour the litter was once more gathered up, the water let off, and all hands assisted in giving water and pot ale, or a mixture of these, to the cows. Afterwards a full feed of dry provender was given them, the dung was taken away, the place cleaned, and the cows' beds relaid. The house was then shut up about eight o'clock for the night. "The provender commonly used at Willow Bank consisted of hay, straw, grass, and green barley, Swedish turnips, and the different varieties of Aberdeen yellow, red tops, &c., also mangold-wurzel, carrots, cabbages, ground oil-cake, bruised beans, and other grains."

The milking-pitchers were of black oak, with a white stave for a handle, upon which there was a graduated scale in black scores and figures, by which it was at once seen how much each cow gave. The clerk, or those who carried the milk into the office, had running numbers of the cows placed upon a slate, and opposite to these numbers the quantity of milk, as shown on the graduated scale, obtained from each cow was set down, and was afterwards transferred into the milk-book.

It was found that there was often a striking difference in the returns from various cows, and it was also generally observed that the quality decreased with the quantity, and *vice versa*. Some cows just after calving gave as much as even 30 quarts per day, while some were dry, or nearly so; but on the average there were obtained every day at Willow Bank 1200 quarts of milk, or about 12 quarts from each of the cows, taking them overhead. It was observed that both the quantity and the quality of the milk was affected by the different kinds of food that were given. "Potatoes, distillers' grains and wash produced the greatest quantity of milk, but the quality was thin and poor; on the other hand, green clover, rye-grass, clover-hay, yellow and Swedish turnips, bean-meal, oil-cake, &c., produced rich milk and a fair yield."

At the milk-office, about seven o'clock in the morning, and in the afternoon, there was always a very animated scene. Here the distributors were in waiting to receive the milk to start on their various rounds. Each distributor had a pair of milk-pitchers, with lids to fit tight, which contained from 12 to 18 quarts. These were locked to prevent adulteration. This was found necessary on account of dishonest servants, influenced by small dealers, sometimes extracting a portion of milk and filling the vessels up with water. To find out a plan that should effectually prevent such robbery gave Harley more trouble, he says, than all the other departments of the establishment. He was ultimately successful, however, in devising a plan "which completely answered the purpose. There were three small tin tubes put betwixt the handle of the lid of the milk-vessel and the lid itself. These afforded additional strength to the handle, and prevented it from bending when another pitcher was placed upon the top of it, which was often the case when the milk was drawn off. The two side tubes were soldered to the lid and the under side of the handle; the centre tube was put down through the lid, and was soldered close round, and the upper end of the same tube was also soldered to the under side of the handle, except a small point about one-sixteenth of an inch, which was left open. This admitted a sufficient quantity of air through the tube to allow the



milk to run off, and at the same it effectually prevented the admission of water. Previous to this simple discovery, the author [Harley] applied to many to learn if they were acquainted with, or used any plan for checking the adulteration in question, but it was admitted by all that they had never been able to devise any scheme that would prevent their servants from putting water into the milk, if they were so inclined, as the hole on the top of the milk barrel or vessel, from which a pin was taken to admit the air, always suggested the facility of introducing water." Besides the pitchers referred to, the distributors also carried, as retail measures, a Scotch pint or quart, and the sixth or twelfth of a pint, the full of these being sold at sixpence, threepence, one penny, and a halfpenny respectively. The milk-carriages were all hung upon springs to prevent shaking as much as possible, and they were drawn through the city by ponies. "The vessels were labelled 'New Milk,' 'Skimmed Milk,' &c., in order that the customers might be sure of the quality of the article which they purchased. Each distributor was provided with a bell to warn the customers, and if any unreasonable detention occurred the customer was given up. Punctuality, in short, was so strictly observed, that each customer knew, within a few minutes, the precise time when the milk would arrive." Each distributor had his own route, and all the routes were so arranged that they could all finish about the same time, and a fine was imposed for every quarter of an hour a distributor was behind the fixed hour in returning. A distributor trusting a chance customer was made responsible for the debt, and it was deducted from his wages on the first pay-day.

The novelty of this dairy scheme, the superior quality of the milk, the cleanliness which characterised the distributors, and the admirable manner in which the establishment was conducted, naturally caused a great demand for milk; and whenever it got into a district, it was noticed that the smaller dealers immediately began to sell milk of better quality, and in more honest measures than they had previously been in the habit of doing.

Harley's dairy attracted the attention of the Highland Society, which appointed a deputation to inspect and report upon it. The report was so favourable, that the Society presented Harley with a piece of plate, bearing the following inscription:—

"Voted by the Highland Society of Scotland to William Harley, Esq., Glasgow, for having constructed a dairy establishment upon a new and extensive plan at Willow Bank, in the vicinity of that city, which was ascertained, upon inspection and report by a Committee of the Society, to possess important advantages. 1814."

We trust this brief and imperfect sketch of a man who gave such a stimulus to dairy husbandry, and who was undoubtedly a great public benefactor, may not be deemed uninteresting by our readers; and we are inclined to think that there is that in his system which, though originated upwards of half a century ago, might be copied with advantage by many dairymen of the present day.

---

## OBITUARY.

Mr EDMUND GOODWYN, Melton, Suffolk.

Mr WILLIAM BLUNSOM, Daventry, Northampton.

Mr JOHN S. MAYER, Newcastle-under-Lyne.

# EDINBURGH VETERINARY REVIEW

AND

## Annals of Comparative Pathology.

---

### ORIGINAL COMMUNICATIONS AND CASES.

---

*Original Exposition of the Anatomical Arrangement of the Hoof of the Horse.* By Professor GAMGEE, Sen., New Veterinary College, Edinburgh.

THE views which the late Mr Bracy Clark led us to entertain on the mechanism of the hoof, were most refreshing to contemplate, compared to those so very vaguely and erroneously set forth by the late Professor Coleman, who assigned about equal importance in the economy of the foot, to what he called the crust, sole, frog, and bars, and I have always found it equally doubtful, when recalling to memory his *viva voce* description, and on reading his work, to determine whether he meant to convey the notion that the hoof was composed of five distinct parts of horn according with the names given.

Whatever were the Professor's notions, neither his descriptions nor illustrations show. But of Mr Bracy Clark's more correct description of the hoof we are in duty bound to make due acknowledgment: he has led us some way on the road towards the true character of its structure. Strickland Freeman, however, in my belief, possessed more exact knowledge of the foot of the horse, and its true functions, than has been shown by any other British author,—viz., that he advanced more simple philosophic ideas, with less mixture of error than any of his contemporaries. However, since all true knowledge has to be worked out by sheer perseverance on the part of many men, the truth having to be elaborated out of error, those of us who enter the field last are the more responsible, because we have had the good men of all times and all countries for our pioneers.

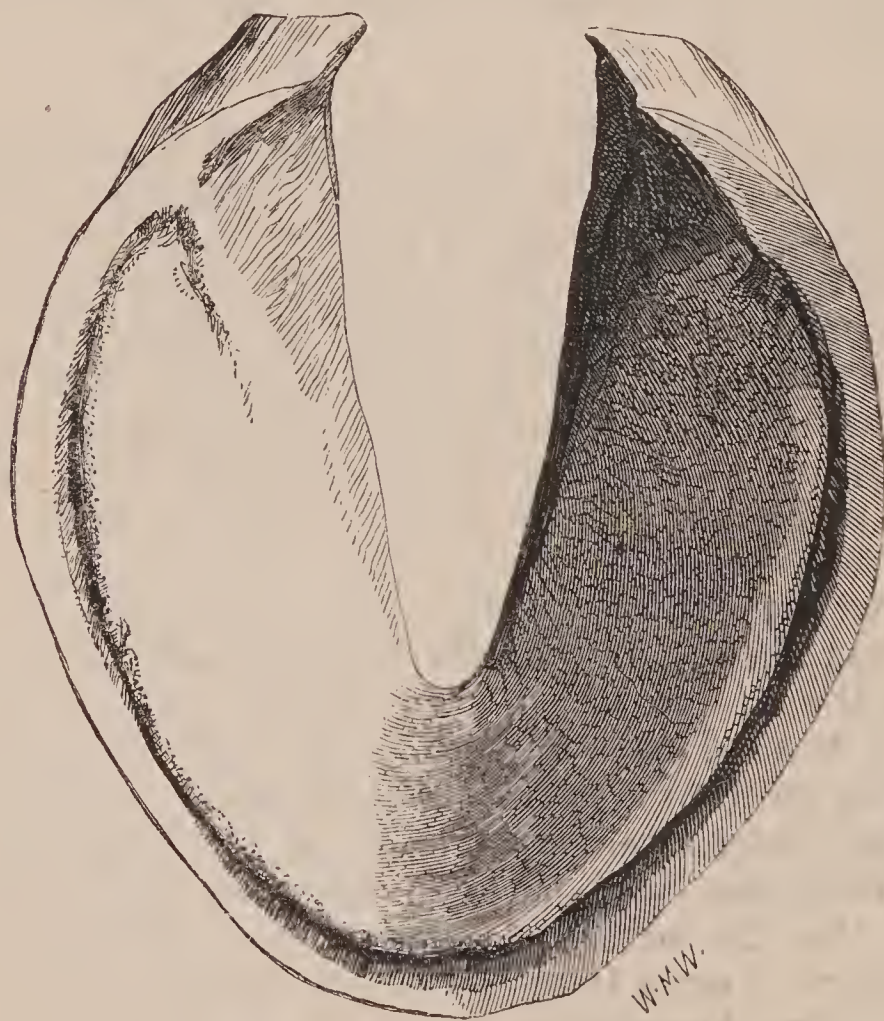
This essay may be regarded as supplementary to others, especially to two which were published in this *Review* in April and May 1863. Since publishing these, I have continued my investigations, and have determined some very important anatomical characters in the construction of the hoof.



I find that the horse's hoof is composed of, and divisible into, two parts, and not into three, as we have hitherto believed.

The wall of the hoof and sole are of one formation, and are not divisible by maceration, as has been stated. Nothing less than a breach of continuity, to be effected by some destructive means, can separate the sole from the wall posteriorly.

Though I am at a loss to adduce any mechanical contrivance, to compare with the construction of the hoof, for illustration, still, as our pioneers in this field of labour have gone so far as to describe the inflected character of the wall posteriorly, giving, as has been said, that strength of substance or inner wall—the bars, I am enabled now to go further and show that the plates of horn constituting the arched sole all radiate from the crest, which takes the involuted form, and which makes up the boundary of the cavity destined to be filled up by the frog.



The accompanying figure shows the position of these parts. The sole is thickest at its point and around the margin, and is there firmly resting against the wall, which forms the point of resistance; an agglutinated horn is there secreted in abundance, which both strengthens the connection and serves to sustain the friction and exertion which the anterior region of the foot is destined to undergo. I shall confine my observations principally to the leading facts. To anticipate all the inquiries to which this essay may lead would be beyond the bounds to which it can



extend. The question of secretion, and the means by which the horn of different parts is furnished, will all command attention, and will not be difficult to treat. To understand the extent of the secreting powers of the different parts of the villous covering of the whole sensitive foot (see *Anatomy of Domestic Animals*, by Mr John Gamgee and Mr James Law); so that now, as we are about to settle other parts, probably all relating to the secretion of the hoof may receive due attention. I may observe in this place, that physiological conceptions have led me on to these anatomical investigations, which have necessarily spread over a long time. Nor could I satisfy myself by examining the foot of the horse only: there were other questions to solve besides those relating to the true hoof, constituted of wall and sole. The source and character of the frog had to be shown, and some complications, introduced by Mr Bracy Clark, required to be set aside. These are referable in part to what he described as the coronary frog-band, or, as he also called the same structure, the periopoli. I could never bring myself to understand any of the functions which Clark attributed to that structure, nor could I discover the distinctiveness of its character; on the contrary, I was persuaded that the soft welt of peculiar horn round the coronet was purely a cuticular formation.

For several years I tried, by maceration and other means, to settle the question for or against preconceived notions regarding the separation of the sole from the wall; writers having described the hoof as readily separable by maceration; the non-success in similar trials, on my own part, was regarded by myself as the result of a non-effective mode of conducting the process. At length, however, the inquiry was pushed to its final solution; and the question was solved of the frog-band or periopoli, about which Mr Clark had laid the greatest stress, for what he called the discovery, and was extremely angry at some of his contemporaries, continental writers especially, for not duly acknowledging his contributions to veterinary science in that particular instance.

I have now shown, what I long believed was the case, that the band of soft horn which rises above the upper margin of the wall, and gives fulness and symmetry to the foot, is an amplification of the cuticle, for that assigned purpose. And I cannot better describe my own views than by using Strickland Freeman's words; for I find that posteriorly this soft horn increasing there forms the covering over the elastic bulbs on either side, and continuing, forms the horny frog.

Freeman expressed himself as follows:—"The coronet returns from the heels inwards and forwards like a dart, and extending itself over the skin of the fleshy sole, constitutes its last outward covering, and in this part takes the name of Frog."



I endorse the above view, and am convinced that, unlike the true hoof, which corresponds with the human nail, and is like the strong claw of other animals, the frog is of cuticular formation, the same as the ergot; which is situated behind the fetlock pad, and which, though brought less into action than the two small phalanges with their hoofs in the cloven-footed tribes, is yet in the highest degree important in its economy in the horse, and should be preserved, instead of being cut down to the skin, as is the common practice under the barbarous custom of trimming horses' legs. The ergot, I say, bears affinity to the frog, inasmuch as they are alike in cuticular formation, having resemblance in texture and function, the frog being the more elaborate, endowed with great strength, and its office is manifoldly more indispensable.

Every anatomist knows the variety in substance, appearance, and uses, which the cuticle assumes in different parts of the same animal; we have only to notice the structure as it is found in man, and compare that which covers the skin in the arm-pit, behind the ear, and even on the back of the hand, and then look on the palms of the hands of working mechanics, or the balls of the feet of men accustomed to walk much; in the one case we find the cuticle unappreciably thin, in the other, taking on a horn-like character and of considerable thickness.

Turning attention to any of the lower animals, from the elephant downwards, we find the cuticle, in parts, of such substance and texture as to be able to sustain much exertion, and even attrition, on the ground. All the dog and cat tribe, especially the larger and more powerful of the species, are endowed with cuticular covering to the pads and balls of their feet, which are little inferior to the frog of the horse for power of sustaining pressure and attrition. The above instances are brought forward to show that the phenomenon of the horn-covering frog being an extension of cuticular formation, need not cause surprise to the most sceptical.

Having announced in the foregoing paragraphs some leading facts, in setting forth my discovery of some phenomena, and by bringing others from the oblivion in which they have long lain, any supplementary remarks on my own part, for the present, I regard as superfluous for the proof of what is stated. I have endeavoured to be plain, and no one can be expected to offer a valid judgment *pro* or *con* before he has, like myself, examined the structures.

I beg to inform the reader that the whole subject concerning horses' feet, of which the phenomena treated on in this paper form but a small part, is one which has required, and will continue to call for more constant and long-sustained labour than most men are disposed to give, or have the opportunity to devote to it; but I predict all would work to a right end if men could only be in-

duced to see this important subject in its true light, and consider all its bearings; the work of advance towards sound knowledge would then be taken up by many, and would become relatively light and agreeable to all.

Though I have been working on the track of the anatomical truths herein expounded, have been advancing from one phenomenon and bearing on to another, my physiological views on the foot have undergone no material change of late. I saw long since the intimate connection which subsisted between the arched substance of horn on which the coffin-bone and cartilages repose, and the wall which encircles the whole structure, that the connection was most intimate in either half of the hoof posteriorly, and that the whole combined in constituting the greatest wearing and sustaining substance anteriorly. I saw and taught that each lateral half of the hoof posteriorly has a free motion under regulating laws, and that in action the posterior extremities on either side with the frog in the centre in co-operation, are drawn upwards. Some degree of bending in the bottom of the hoof, from a transverse line across its centre, goes on, the point of resistance being the front, where the strong agglutinated union of the horn plates beneath and the wall in front afford the strength.

The perfect state of the foot consists in the hoof being of symmetrical form, which implies integrity of parts, their normal development, and consistent preservation. In such state we have the strength of the hoof and its supporting powers in greatest abundance at the front and the two columns of the heels. Whilst the frog, by spreading round from the coronet, and becoming expanded and thick over the bulbs, and increasing in density as it pushes forward over the triangular fibrous structure; which, bending round from its connections with the cartilages on each side, is attached in the centre and bottom of the coffin-bone and fascia, by which construction is given an addition of strength incalculably potent.

Briefly recapitulating some of the most important statements made in the preceding part of this essay, I wish to make known that I have found the wall, and sole, as it were by reflection and inversion, to constitute together the true hoof of the horse, as these parts do in the same united structure make up the less elaborate hoofs of all the cloven-footed tribes. The frog is in the horse a distinct organ, in its perfectly developed state as found in that animal; and though the cloven-footed have structural parts, consisting also of the fibrinous and cellular tissues, very analogous to the frog of the horse's foot, none have the same development, or so extensive a range of functions. The horn covering of the frog, altogether different in texture to that which I have called the true hoof, closes up the posterior part of the foot.



In adopting Strickland's view of tracing the course and physical aspect of the frog, I see no use in giving a distinct name to the thickened cuticular *welt* at the coronet, it has no distinct existence, and the word coronet is ample for indication, thus we say, the coronet at the front of the hoof, at the inner or outer quarter, &c., whilst separate names to the same parts, where so many structures centre in the foot of the horse as they do, tends only to confound.

In the late Mr Bracy Clark's work, the reader will find a plate, in which is shown the detached frog, with what he considered a separate structure, and called it the frog-band; he also applied the term *periopoli* to the same.

In Professor Bouley's work on the Anatomy of the Foot of the Horse, is also given an elaborately artistic drawing of the same part. The latter author is trying to follow the first. But whilst the illustration given by our own countryman is eminently original and artistically faithful, excepting the readily excusable oversight which both the anatomist and artist made regarding the connected structure of that band, above and below, and of its rising out of the common cuticle, and being part of it. I can easily see how the mistake occurred, the time and work it has cost me to clear up that point lead me the more to appreciate the worth of what Clark did, and the help I have derived from the advances he made.

The illustration in M. Bouley's work, intended to show the same parts in a different and more extended way—simply represents nothing of truth, but is clearly a drawing from the upper and inner surface of a section of the hoof.

In conclusion, I beg to state, that no attempt to advance true knowledge of the foot of the horse, or even to learn all that is known, except by well conducted dissections, can be expected to succeed; and nothing but the foot itself can reveal its true characters, teach us its exquisite beauties, or lead to an understanding of the causes and character of its diseases, sources of the most intense of constant suffering.

---

*Cardiac Polypi in a Mare.* By JOHN GEORGE DICKINSON,  
M.R. C.V.S., Boston Lincolnshire.

THE subject of this affection was a bay three-year-old filly, the property of C. Simonds, Esq., of Fishtoft, near Boston. I had previously attended the filly and blistered her for a severe sprain of the off fore fetlock joint, but of this she recovered. She was in foal to a thorough-bred horse "Augur," and her term of gestation had already expired seven days, when I was called in to

see her. The foreman having noticed a great falling of in condition, and a diminution of the abdomen to nearly half its previous size, came to the conclusion that the foal was dead.

*Symptoms.*—The subject was in state of great exhaustion, scarcely able to move, with great tenderness over the loins, injection and slight yellowness of the visible mucous membranes, acceleration and irregularity of the pulse, and marked venous pulse in the jugular veins after the slightest exertion. When the filly was in the least degree excited there was more or less violent palpitation of the heart, and at times the pulse was scarcely to be felt. She was very languid, and rested her head against any projecting object.

I considered it a hopeless case of heart disease, but administered stimulants to sustain the vital powers.

On the day following the general appearance of the animal was improved, and the appetite better. The pulse remained intermittent and irregular, and there was violent palpitation of the heart on the slightest fright or exertion; but the venous pulse seems less marked, and the injection of the mucous membranes somewhat less. The near fore leg was kept fully extended and abducted from the body. The breathing was less frequent than in pneumonia, but became greatly accelerated after feeding, the slightest distension of the stomach seeming to impede the free action of the lungs. The patient still sought to rest her head. She now received a bolus containing Fleming's tincture of aconite, and sesquicarbonate of ammonia, and had blisters applied to the sides of the chest.

On the third day the mare was to all appearance rather better. The foal was evidently alive, and the mammary glands slightly enlarged. The tenderness over the lumbar region was greatly increased. The cardiac palpitations continued, and the pulse remained as before. To have chloric ether every four hours.

My assistant Mr Rowe, accompanied by Mr Todd, called the same day and found the filly down, having just given birth to a live foal. As the mare was unable to rise, wine and sulphuric ether was given, but she gradually sank, and died at ten o'clock the same evening.

The heart I forward by rail. In addition to the morbid appearances met with in that organ, the uterus contained a bucketful of blood, and the posterior lobe of the right lung presented disease of recent occurrence.

*Remarks.*—The heart forwarded by Mr Dickinson, when viewed externally, presented no very marked variation from the natural form. The right auricle and ventricle appeared to be increased in size. On cutting into the auricle, the upper surface of the tricuspid valve was observed to be covered by extensive morbid deposits. On laying open the right ventricle, by a verticle sec-



tion parallel to the septum ventriculorum, and examining the lower aspect of the valve, the morbid deposit was found to be much less abundant than on the upper surface. The extent of the deposit likewise varied greatly on the different flaps. That applied against the posterior wall of the auriculo-ventricular orifice was only slightly affected. It presented however on its upper aspect, and about a quarter of an inch from the edge of the valve, a range of slight elevations flattened on their summits, and at some points covering a surface of nearly half an inch. The left flap, or that applied against the pulmonary infundibulum, was much more extensively diseased. On its anterior half, the morbid material projected from its upper surface in the form of irregularly rounded masses, individually about the size of a boy's marble. The posterior half of this flap showed only a roughened surface, like that on the posterior division of the valve. On each of these two portions of the valve, the adventitious products only existed on the upper or auricular surface. The external flap of the valve was much more extensively diseased than either of the other two. Here the morbid deposits existed alike on the upper and lower surfaces. Covered at all points by diseased products, this portion of the valve, nevertheless, presented several large projecting and pedunculated masses, of which the largest exceeded a pigeon's egg in bulk. Close to the attached border of this external part of the valve, the surface of the auricle presented morbid deposits of a similar kind, though of small size. The adjacent wall of the ventricle was similarly affected, and the cordæ tendinæ passing from the papillary muscle, on the outer wall of that cavity, were considerably thickened, and had deposits of the same kind on their surface.

The semilunar valves at the commencement of the pulmonary artery appear thickened and injected, while both the aortic semilunar valves, and the bicuspid one, are healthy. The other parts of the endocardium, whether on the right or left side of the heart, present nothing abnormal.

Some of the smaller excrescence on the valve and endocardium appear to be the result of lymph thrown out beneath the endocardium, since they are covered by a delicate membrane, continuous with the latter structure. The larger and pedunculated masses are, however, devoid of such a covering, and have a granular appearance like that of coagulated fibrine. The pedicle and deeper parts of each polypus are vascular, while the surface appears destitute of vessels of any description. Under the microscope, the latter material appears almost as a homogenous membranous structure, with some tendency to arrange itself into fibres.

The morbid deposits seem to have originated in an attack of endocarditis, and the exudation of lymph. On the diseased surface thus produced, layer after layer of fibrine has been deposited from

the blood, and at the time of the mare's death, several of the fibrinous masses thus produced had become partially organised by the formation of new vessels in their structure.

---

*Practical Cases.* By the SAME.

*Fractures Treated by Starch Bandages.*—CASE 1.—A valuable chestnut cart gelding (the property of F. Coupland, Esq. of Fries-ton) sustained a compound fracture of the right metatarsal bone from a kick of another horse that stood next him. I had the leg bathed with cold water for some time to reduce the swelling, and then applied a starch bandage from the heel up to the patella, with suitable compresses. I had the horse tied short by the head, and confined by planks into a narrow space, so that he could not well move. I then had the shoes removed from the fore feet, and carefully attended to the diet. In the course of eight weeks he went to work perfectly sound.

CASE 2.—This happened in a chestnut filly, the property of Mr Hansard of Mount Pleasant. The tibia had been fractured a whole week before I saw the case, and the owner thought proper, as a mere act of humanity before killing her, to have my advice. There being a simple fracture of the lower part of the tibia, I placed a rope round the fetlock joint, and upon this, my assistant pulled, so that I could replace the disunited portions of bone in their proper position. I applied a powerful starch bandage from the heel upwards, and then a stout leather supporting bandage over that. The filly not being strong enough to rise, I had her kept on the ground for four days, and then, with assistance, managed to place her on her legs. She recovered with but little alteration of the limb, and free from lameness. This filly was turned into a loose place to take her chance.

CASE 3.—A chestnut blood mare, belonging to a Mr Maidens, Poulterer, of Boston, had been lame some time, as was supposed, from a strain. Upon examination, I found that the large pastern bone was fractured obliquely. The mare was down, quite unable to rise, and suffering great pain. I reduced the swelling by the application of cold water, and applied a starched bandage. After the mare walked sound, I blistered the pastern, and turned her out to grass for a month. She recovered, and now works sound.

CASE 4.—A valuable hunting mare, the property of the Rev. —Russel of Kirton Fen, being frightened by an engine, attempted to jump the railway gates. She fell, throwing the owner with great force, and from coming in contact with the top rail, sustained a fracture of the nasal bones, accompanied with a laceration of the membrane of the false nostril. There resulted a con-



siderable hæmorrhage with slight depression of both nasal bones. By the application of cold water and astringents, the bleeding was stopped. The depressed bones were pushed up into their proper position, the mare's head was kept tied for some time, and sloppy food only was allowed. The patient soon recovered.

I have had several more cases of fracture treated successfully by starched bandages, and I can strongly recommend them to those who have not given them a trial. The use of slings must be avoided in the majority of cases. I consider that a great amount of constitutional disturbance is the frequent result of at once placing the horse in slings. If you must throw all the weight upon the abdomen and thoracic viscera, do so when your patient understands what is the matter with him. For my own part, I would sooner trust to a large loose box, with short litter, after the horse has been confined by the head for some time. If he has room, he will contrive to lie down and rise without doing much injury. Starched bandages are also of the greatest use in the treatment of open joints, keeping the limb in a fixed position and can with facility be arranged, so as to allow space for your dressings.

---

### *Chronic Lameness of Horses.*

ALDERSHOT, 8th April 1864.

SIR,—Having read with great interest the Essay on “Chronic Lameness of Horses,” by Professor Gamgee, senior, which is printed in the “Edinburgh Veterinary Review” for April, and while fully appreciating the importance of the subjects therein considered, as well as the ability and great experience of the learned Professor, I feel there should be no possibility of the public misunderstanding the author of the essay, or the opinions entertained on these subjects by other veterinary practitioners, who may not have had the Professor's experience, or the advantage of his teaching. I may therefore be excused if I take exception to the statement made by him at page 198, viz., “Contraction of the hoof has been always alleged as the precursor of navicular disease, besides an unknown quantity of bruising and concussion to the bone and its capsule from the ground.” I, and doubtless many others, believe that contraction alone does not produce navicular disease, and is not attendant upon it, in the early stage in the majority of cases; neither do I look to bruises of the bone or its capsule for the exciting cause of the disease, although I do not expect to find absorption of the bone internally as the cause or first condition of the disease.

Again, at page 206, the Professor, among other useless(?) remedies, discards “wet in any form;” but in the same page he re-

commends the application of fomentations of warm water to each foot twice or thrice daily, to be followed by the application of some ointment to the feet. This appears to me a contradiction; and although I agree as to the usefulness and good likely to result from bathing an inflamed part with warm water, I am at a loss how to accomplish this, and at the same time abstain from applying "wet in any form."—I have the honour to be, Sir, your most obedient servant,

The Editor E. V. R.

ALFRED J. OWLES,  
V. S. General Staff.

I will do my best in trying to clear up the questions to which Mr Owles takes exception, to avoid being similarly misunderstood again, by himself or other readers.

Firstly, where, at page 198 of the April number of the Review, I make the statement noticed, it may be seen, by reading on to the next paragraph, that my own words are only given as introductory to the latter, where I quote from Turner, thus:—"I am thoroughly satisfied, that when contraction is accompanied with chronic lameness, disease exists in the navicular joint, either structural or functional, and that this complaint is neither more nor less than a *bruise* of the synovial membrane lining the joint."

In making reference in this and other places to *the* author on the subject, I in no way held myself responsible to the meaning of the words expressed, nor do they represent my own knowledge or opinion on the matter. I know, as undoubtedly Mr Owles must, that other writers also, too numerous to quote here, use expressions similar to those of Turner; and if there be exceptional and different opinions held, they must have remained unpublished, or I shall be glad to be informed where they are to be found.

I reply to the second query, referring to page 206 in the Review, where, in condemning the all-prevailing custom of applying wet to horses' feet, I use the sentence partially quoted by Mr Owles, that I discard *wet in any form*. I prefer reproducing the latter part also of the same paragraph which runs thus:—"In none of the cases of foot lameness contemplated in this paper do I ever bleed the horse, either locally or generally; never apply setons; never divide the nerves, thereby making the horse exert structures too much diseased to admit of being freely used. I never apply leather or any other soles, but seek to develop and utilize the natural soles of the animal. Apply no dung, cow's or other, to the feet, nor yet clay or *wet in any form*." The whole of the above was directed against a custom, not alone sanctioned in veterinary practice, but one in every-day use; nay, one carried out all the year round, to the great injury of the best horses in existence.



Where, in the next paragraph I say, "*in cases where acute pain in the feet prevails, we apply fomentations of warm water, keeping each foot in it for about fifteen minutes twice or thrice daily.*" I submit that the practice set forth in the last in no way stands in contradiction to the statement and precepts of the one shewn above. For instance, I may say that I am not an opium-eater or a dram-drinker, and yet in strict consistency take prescribed medicinal doses of the drug or spirit.

With equal consistency may I also, whilst using my shower-bath every morning as I rise, and though I wash several times during the day in an ample quantity of water, reject as an absurd proposition an order to place my feet for hours in cow dung, clay, or swabs, or in *wet in any way* ; and if the proposition came in a compromising form for applying these slimy substances two or three nights in the week, or even only from Saturday night till Monday morning, the palliation would seem slight, and the insult to common sense equal ; and if called on to stand with feet so surrounded, with my shoes on, and then made to exert myself by walking or running, then rebellion, would take the place of quiescent refusal.

Again, it should be understood that I do not under-estimate the renovating effects of water, duly used to the exterior of the horse or other animal ; and that I have nothing to say against hydropathic treatment when rationally conducted ; moreover I extemporised the method by degrees, of employing water dressings in my surgical practice, long before the custom of irritants and greasy dressings had received their merited condemnation ; but my essay, to which allusion is being made, has reference to hoofs of horses, and I am exposing customs of soddening them with wet and filth, which I have proved to my own conviction to be destructive to the economy of the whole foot.

Nature has given to all amphibious animals such construction of foot as is suited to the elements they inhabit ; but we never find hoofs given to any of that Order. As I have at other times said, all animals provided with hoofs are destined to live and move on firm soil ; and I should not have thought it necessary to lay so much stress on this physiological phenomenon as it applies to the foot of the horse, had I not been aware of the extent to which the evil custom referred to is carried ; and since I have seen the error, I have found it to be one of the most difficult to combat, so deeply rooted is prejudice in its favour.

Returning to Mr Owles' first query, and in reference to that gentleman's own words, applying to the state of the navicular bone, where he says, " although I do not expect to find absorption of the bone internally, as the cause or first condition of the disease," I beg to remark, that such phenomena may be present, and are none the less relevant in the solution of great questions, because they are brought forward unexpectedly ; I look on

much of the value attaching to my essay, to which Mr Owles refers, to be due to the exposition of views not expected. Mr Owles, in good faith doubts the accuracy of my statement, that the wasting of the navicular bone proceeds from its internal centre and not from its surface; but doubting and the evidence for refutation are different things.

Respecting, as I do, the opinion of a gentleman who frankly avows his adhesion to old notions until sufficient evidence is produced to persuade him to adopt new, I must persist in sustaining the positions I have taken up, they being based on proof ample and positive. I hope that inquirers, whose business it is to learn the true state, will investigate the subject; and if any one finds a navicular bone ulcerated on any part of its surface, and not affording evidence of greatly altered internal structure, I shall take it as a favour if they will send me the specimen for inspection, promising on my part to preserve and restore the same. Furthermore, any case of diseased navicular bone, where the coffin-bone in connection, is in normal condition and sound, will be equally interesting to me, as will also the phenomenon of the joint capsule showing signs of confirmed inflammatory action before the navicular bone itself has become diseased.

There is one encouraging prospect that can be held out to those who, for their own satisfaction, institute inquiries into the above questions, yet, although that which is *expected* and sought for may be hard to find, other phenomena not thought of will appear, which in the end will richly repay the labour of any ardent investigator into nature's laws, relative to the economy of the Horse's foot.

JOSEPH GAMGEE.

---

*Obstructions in the Bowels of Dogs.* By THOMAS GREAVES, M.R.C.V.S., Manchester.

THE subject of this communication may not possess to some of my readers that interest and value which it would have demanded, if some mode of treatment had been adopted whereby a cure had been effected, and the lives of all my patients saved. Others, again, may think as I do, and maintain, that those cases that recover are not always the most interesting, or capable of affording us the most valuable information as a future guide, or of exciting the same degree of useful contemplation and reflection, as do well-marked cases during sickness, with the additional advantage of seeing palpably, the real, true state of the case after death. In all cases that recover, we can only approximate to the truth by surmise. In some cases the opinion formed from symptoms, and the diagnosis, may be very wide of the mark, but, the patient recovering, the error is never found out. I maintain further, that



the simple fact of a patient recovering, is not always a certain and satisfactory proof that our view of the case was precisely correct, and that the treatment was the best and most proper treatment, any more than it would be right to conclude in cases that die, that because our patient did not recover, was a proof that our treatment was not the best and most proper treatment. But to my point. A few months ago, a small terrier dog was brought to me apparently in the last stage of sinking from exhaustion, with a solid compact substance projecting from the anus. It appeared a perfect fixture, and had been in that state for several days; the rectum was in a partially prolapsed state. The substance had been grasped by the sphincter ani, and it could neither move backwards nor forwards. He had been constantly yelling and in great pain for several days. I carefully and gently grasped this substance with two pair of forceps, and by dint of drawing gradually and gently (at the same time requiring considerable force), and carefully manipulating the membrane of the rectum over the substance, I succeeded in removing a large angular bone, densely enveloped in dry baked food. The dog rapidly recovered. But the question of interest to contemplate is, how long had it taken for this large piece of bone to pass from the stomach to the end of the rectum? Remembering at the same time the small calibre of the intestines of the dog, each inch of the bowel, step by step, had been preternaturally distended, and yielded to admit of its passage at all.

*The 2d Case*—was a middle-sized dog of the retriever and mastiff breed. About a week or two ago I was requested to make a post-mortem examination of him, as it was suspected he had been poisoned. He was found dead in the morning. The night previous he was, as they believed, in perfect health. I found the bowels perfectly empty, but the stomach full of clean bones (unmixed with any other food), small angular bones, more than a basinful; but that end of the stomach just at the entrance into the duodenum, the bones were all of one kind, viz., broken or split cylindrical bones, like fowl leg-bones, about a large breakfast-cupful lying across the opening, completely blocking up the passage; all perfectly clean, with no admixture of any other food. The stomach was inflamed. Now I was assured this dog had eaten his usual food up, the night before. The impression upon my mind was, that these bones had been there some time, say many days, perhaps weeks, in the stomach, and that his regular meals must have been regularly vomited, but the bones he could not vomit.

*The 3d Case*—was a large mastiff and retriever I was called to a few weeks ago. He had had no motion for four weeks. He was a voracious feeder—a few months before he voided a large champagne cork. I injected enemas, passed my forefinger up the rectum, and gave various powerful purgatives. I could feel,



by external examination, a very large solid substance in the bowels. He died at the end of three weeks, having been seven weeks without having had any passage whatever. On making a post-mortem examination, I found an accumulated mass of dry food, resembling half-baked dry dark-coloured clay, but not gritty; it was greasy on being rubbed between finger and thumb; in form it resembled a large German sausage; it was 2 lb. 6 oz. in weight, 19 inches long,  $2\frac{1}{2}$  inches in diameter, and situated abutting against the bones of the pelvis. If it had not been for the long obstruction, the bowel would have been expanded to allow of its expulsion.

---

*Tetanus.* A Paper read before the North of England Veterinary Medical Association. By Mr J. THOMSON, Sunderland.

MR PRESIDENT AND GENTLEMEN,—Before proceeding immediately to the subject of the paper which I have engaged to prepare and submit to your mature judgment and scientific knowledge this evening, I would remark, that I have nothing novel or extraordinary to advance, either in physiological, pathological, or therapeutical point of view; but simply to provoke free discussion, independent thought, and investigation.

Science is of little value to the general community, unless it can be brought to bear practically on the business of life, therefore the responsibility of its proper application, devolves chiefly on the professional man.

The well-trained and educated veterinarian is a man of enlightenment and observation, having a thorough and practical knowledge of the animal economy in a state of health and disease, which are essential requisites to the efficient fulfilment of his arduous duties and avocations.

The word “Tetanus,” is derived from two Greek words signifying *to stretch*; and is generally used to denote spasm with rigidity. It is one of the most painful and melancholy diseases which flesh is heir to; common to the horse, occurring occasionally in the ox, and sheep, but seldom in the dog. The various forms are distinguished as,—acute, chronic, traumatic, or symptomatic, and idiopathic; which, however, are various, according to the different class of muscles more or less involved; thus, when the maxillary and pharyngeal muscles are rigidly affected, it is denominated “Trismus”; and when *all* the voluntary muscles of the neck, spine, tail, and extremities are spasmodically affected, it is then designated “Tetanus.”

The idiopathic form of this disease in the horse is considered by many veterinarians to be the most frequent; but speaking from my own experience, I have had more cases of the traumatic character.



This dreadful and often fatal disorder proceeds from various causes ; a very fertile source is wet and exposure to cold, or, a sudden chill after severe exercise ; also in consequence of local injuries from punctures, incisions, lacerations, and bruises ; or sometimes spontaneously, as in hot climates. I have known it arise from firing, docking, castration, punctures of the feet, wounds in the joints of the extremities, injuries to the spinous processes, scapula, nasal and orbital bones.

When the disease has arisen in consequence of a puncture, or any other external injury, the symptoms show themselves generally from the sixth to the tenth day ; but when it proceeds from exposure to cold, they appear frequently much earlier ; in some instances, however, it comes on suddenly, and with great violence ; but it more usually makes its attack in a gradual manner, in which case a slight stiffness is at first perceived in the neck ; the muscles of the eye, especially the retractor oculi, show the earliest spasms.

The diagnosis of "Tetanus" in the horse is generally speaking very easy ; on the first appearance of the disease, the patient appears to ail but little ; he neighs when any one enters the stable, and seems eager for his food, which together with saliva drops from his mouth ; his paws are found to be stiff, the eye squints, and as the disease continues to advance, the affected muscles feel hard to the touch, and he moves as if he were a single piece ; the motion is painful, and agitation produces the greatest distress. During the whole course of the disorder, the abdominal muscles are violently affected with spasm, so that the belly is strongly contracted, and feels very hard, whilst the most obstinate costiveness prevails ; and as the disease extends over the voluntary muscles of the trunk and extremities, the appearances are distressing in the extreme, whilst profuse perspiration bedews the whole frame.

The circulation is in most instances at first, not much disturbed, but as the disease increases, the pulse quickens and becomes tremulous and irregular ; the respiration also gradually becomes hurried and intermittent. In this state the suffering animal may live a few days, when worn out by irritation and inanition he expires in convulsions.

Morbid anatomy has hitherto thrown little light on the pathology of Tetanus. In some cases there have been appearances of inflammation within the cerebral cavity and spinal canal ; also in the lungs, stomach, and intestines, as well as other morbid phenomena, which seem to have been merely effects, or incidental accompaniments of the disease. In many cases the injured nerve of a wound has been found thickened and inflamed, whilst in others, nothing of the kind could be detected.

I have found the lungs, liver, and stomach, highly inflamed with patches, evidences of the same action having seized the in-

testines. Worms have been found in different portions of the alimentary canal, but they have also been found in many other morbid cases besides that which we are now considering.

Tetanus appears to be purely a nervous affection, involving principally the motor, cerebral, and spinal, and subordinately, the ganglionic and sympathetic systems. Upon taking a survey of the entire nosology of hippopathology, I know of no disease where so much discrepancy of opinion exists among veterinary practitioners; nevertheless, in order to combat this most formidable disorder, the treatment should be prompt, bold, energetic, and continued.

Accumulated successful facts warrant the free use of the lancet, strong cathartics, powerful sedatives, severe blistering of the nervous centres, warm clothing, pure air, liberal support, and quiet seclusion.

But gentlemen, without enumerating in detail the various agents which have been more or less successfully, or otherwise, adopted by veterinarians, I will confine myself to a brief outline of the history of a few cases from amongst many others, which I specially have had under my care, advice, and treatment.

1st, Of a *Traumatic character*, in a gelding three years old. About the sixth day after being docked, he was observed by his owner to be somewhat stiff, and on the following day, when attempting to move him backwards in his stall, having lost his balance, he fell; on the eighth day I was called, and on entering the stable, at once perceived that the well-marked tetanic rigors were in full play on the poor suffering animal, the jaws being nearly closed.

The treatment pursued was, first, to amputate the tail afresh, excising about three and a half inches, two and a half of which were already in a state of gangrene.

A strong purgative combined with sedatives was administered, the whole course of the spine blistered, a fluid nutritious diet allowed, and the body plentifully clothed with woollen rugs, continuing the treatment a little more than a fortnight; at the expiration of three weeks he was much better, and in a month perfectly recovered.

2d, Of an *Idiopathic nature*, occurred in a powerful brown cart mare, nine years of age, apparently a hopeless case,—so much so, that an aged practitioner pronounced her to be in a dying state, and considered she would not live fifteen minutes. Symptoms: Violent spasms, rapid and loud breathing, profuse perspiration, the head protruded, tail erect and quivering, legs wide apart, straddling, and fixed, jaws almost closed, muscles rigid and hard, and intensely pained.

In this instance my patient was bled to the amount of *eight quarts*; gave strong doses of purgative and sedative mixtures with diffusible stimulants; blistered over the jaws, the nape of



the neck, and each side of the cervical vertebra and course of the spine to the tail, with fresh sheep skins to the back ; afterwards warm clothing, a liberal and nutritious dietary in the form of drinks and injections. After three weeks of this treatment, a visible change for the better was manifest, and a gradual recovery took place up to the eighth week, when the animal was put to work, and continued strong and healthy for several years.

3d, *A very severe case of Traumatic Tetanus* in a strong and valuable cart mare, five years old, belonging to a farmer in the neighbourhood of Sunderland, arising from a puncture in the off hind foot, caused by a nail picked up on the road.

The lameness was at first slight, and the mare was kept at work for near three weeks, which is too often done in similar cases. Although the owner noticed some peculiarity in the movements of his animal, he attributed it to be "grease flying about her." At length being sent for, I found a bad case of locked jaw to contend with ; the poor creature was suffering dreadfully, and completely fixed to the place where she stood. Having ascertained the cause, which should never be overlooked by the veterinarian at any time, the farrier was at once sent for, the shoe removed, and parts well pared, which was done with extreme difficulty, as the suffering animal threatened every minute to fall on the operator. The foot was enveloped in a large poultice, and blood freely abstracted from the jugular ; strong cathartics with opiates were administered and repeated at regular intervals ; the spine, neck, throat, and jaws, severely blistered, and fresh sheep skins applied to the back every third day for three weeks, not neglecting diet in a suitable form. In the fourth week, a change for the better took place in my patient, when warm rugs were substituted for the skins. The treatment was continued for seven or eight weeks, when, after a slow and gradual recovery during the space of three months, she became quite strong and vigorous, and has continued as such up to the present time.

As I expect, there will be other interesting subjects, remarks, and observations brought before the meeting by our respected Secretary, and probably by other members, I shall only describe another case of traumatic tetanus, which took place in a valuable half-bred mare six years old, by "Lancewood," arising from a kick on the inside of the hock-joint of the off-hind leg when at grass during the past summer, the injury to which was comparatively trifling, the lameness being scarcely perceptible. She was taken up, placed in a loose box, and supplied with cut grass, and the wound healed slowly but gradually. About the fourth week, in walking, she was observed to have a peculiar jerk with the affected limbs, and numbness in turning round. At length the eyes showed the unmistakeable tetanic expression, with a shooting out of the nose, and partial closing of the jaws ; in short

all the tetanic convulsions were well marked over the frame of the suffering patient.

The treatment in this was similar to that pursued in the previous cases (with this addition, a severe blister being placed over the affected portions of the hock-joint), and being continued for one month, a gradual recovery took place from that time.

The discussion which followed was of an unusually interesting character, and fully sustained by all members present, the substance of which went to prove the indispensable use of purgatives gradually but persistently exhibited.

Upon the subject of bleeding in tetanus, there appeared a difference of opinion as to its real efficacy, several members being inclined to the belief that it should not be resorted to unless in the event of disease in important organs having commenced or suspected to supervene; others rely on the abstraction of blood, with a view of a temporary relaxation of muscular spasm, which would enable the practitioner to administer proper medicines. It was deemed advisable not to bleed animals in low condition, but it was admitted that as a rule in robust patients, much is to be gained by the practice in a majority of instances.

Various opinions were expressed as to the unfavourable results which invariably occurred when a tetanic patient had lain or fallen down in the stable, especially when the symptoms previously characterised a return towards health; and it was recommended that, as a preventive means, slings should be adjusted into which the animal might fall, but not intended to take his weight from the ground.

Mr Hunting and Mr Peele related several instances in which the animals were progressing favourably, had gone down during the night or absence of the attendant, by which such injuries had resulted as caused death.

Mr Scott described a case of tetanus, where the animal dropped several times during the attack, and by having a set of pullies in readiness, the patient (a mare) was raised and ultimately recovered.

Mr Hunting, Mr Peele, Mr Scott, and the Secretary, agreed upon the extreme rarity of the disease among pit animals, notwithstanding the innumerable cases of punctures from nails, &c. which constantly occurred, when it was suggested that atmospheric influence was exerted to a less degree below ground, or, in other words, animals predisposed to tetanus, having received an injury calculated under other circumstances to produce it, as a rule were exempt in the pits, arising possibly from the generally uniform state of the atmosphere, which is thus deprived of its effects to a great extent.

At the close of the discussion, the following papers, illustrated by drawings, were read by the Hon. Sec., Mr G. Armatage :—



*Tumour within the Substance of the Brain.*

The subject of the present paper occurred in the practice of Mr Thomas Thompson, Sunderland, a brief history of which is as follows :—The animal, a black horse, nearly sixteen hands high, of compact form, and cleanly appearance, came into the possession of the owner about five years ago ; and excepting the space of three months past had always appeared in perfect health, never having been under treatment for the slightest cause—he, however, was of an excitable nature, and a great eater.

About the time above mentioned, viz., in November last, the symptoms of excitability increased from day to day, exhibiting marked degrees of intensity, varying in accordance with the modified circumstances under which the subject laboured. Being employed for carting purposes, it would appear that his work added to the diseased condition of the brain, the symptoms being more or less developed in proportion to the application of stimulus. The symptoms of excitability noticed in the first instance will admit of being described, as forming the premonitory indications of disease going on within an important organ, and as essentially differing from those which characterize animals of innate nervous temperament, and lighter breeds.

The animal, as previously stated, was of the cart breed, thickly set, short coupled, neatly moulded, and strong muscular proportions. The head was large ; eyes rather small ; labial apparatus large and pendant. Hirsute appendages also plentifully distributed, especially the mane and forelock. In fact, from an animal of the description, one would imagine the work expected from him must, in circumstances apart from disease, be exacted only by dint of merciless applications of the whip, if required expeditiously at least. On the contrary, however, the animal betrays an unusual amount of sensibility to surrounding noises, &c., far beyond his apparent nature ; passing objects are also observed with more than ordinary attention. There is a tendency to carry the head a little towards one side, the ear of the same side either drawn in an attitude of listening, or otherwise hanging for a time useless, during portions of the journey. This attitude gives way to the habit of shaking the head, little at first, but as the disease advances more in proportion, until the act is so violently performed, that the animal goes through a paroxysm of convulsive throes, during which, the equilibrium is with difficulty maintained, and absolutely dangerous to those within reach. At other times, the head is thrown upwards and backwards, the muscles of the neck, back, and loins, with those of the legs, being instantly rendered hard and tense by forcible contraction ; the principal weight of the body being supported upon the hind-legs, which are brought thoroughly underneath ; the jaw protrudes over the eye ;

tail outstretched and quivers, and altogether the sufferer presents a pitiable appearance.

The drawing of a load up hill, when perhaps a light collar interrupts the return of blood from the brain, sudden fright, blows, particularly over the affected parts, bring about the afore-named symptoms in all their hideous severity, during which, the animal is brought to a stand, and here there is not unusually a resemblance in the conduct of the subject to that which occurs under an attack of megrims, for no sooner is the paroxysm over, than he looks round for the cause, as it were, and moves on as if nothing had occurred. These symptoms are also equally produced by the infliction of brutal treatment in the stable, a peculiar sensibility to harshness being always manifest.

By degrees, the marked suspicion with which all passing objects are at first regarded grows less as the affection proceeds; the ears are now brought more into requisition, and especially is this to be noticed in those instances where pressure causes blindness of one eye only. In the case before us, blindness took place gradually, and became complete in both organs shortly before professional assistance was sought; and for some length of time prior to the loss of vision, the peculiarity of the disease was manifested also by a practice (which increased with it) of the animal violently rubbing the right nostril against the nearest object, and when doing so, being entirely oblivious to all that was said or done.

It was at the commencement of the present year that the case was first introduced to the notice of Mr Thompson, when the symptoms were developed in their intensity. *The appetite was ravenous*, and other functions were performed with regularity. The condition, as indicated by appearances, was all that could be desired.

As will be already supposed, the prognosis of such a case would be the reverse of favourable. Yet the owner pressed for something to be done, and accordingly our friend placed a smart blister to the poll, and administered cathartic medicine. Shortly afterwards, consent was given for the destruction of the creature, which was all but useless from the violence of the symptoms, the head being reserved for examination on Thursday the 18th of February last, when Mr Thompson kindly forwarded me an invitation to be present, and, from the state of the diseased parts as they were exhibited to view, I have been enabled to put together these few remarks, under the belief that at least the subject is of an interesting nature, and calculated to form an integral part of our Society's Transactions.

#### EXAMINATION OF THE BRAIN.

The frontal and parietal bones were carefully removed, when sufficient evidences existed of the turgid state of the circulatory



system within and around the organ; but as it was finally removed from its well adapted case, the larger and important network of vessels at the base were filled, and when necessarily divided by the scalpel, clots of blood rolled out.

An incision was first carried through the right hemisphere, commencing over the *corpus callosum*, in the anterior longitudinal fissure, dividing the lobe over the lateral ventricle, the objects in which, except in certain particulars hereafter to be noticed, were observed to be in a normal condition.

The lateral ventricle of the left hemisphere was exposed in a similar manner, when a mass of disease presented itself; the cavity was filled with a thick matter, not unlike curds in consistence, semi-transparent, and of a blue grey colour, in places varying to an opaque, with shades of dark pigment increasing to blackness, especially when viewed in the mass. The medullary matter forming the roof of the natural cavity was also implicated, being softened and broken down, and in the centre, wanting. The cortical portion was inky in appearance, which stained the fingers, the space nearly corresponding to the size of the ventricle above being the part in area affected, and at the central point was not a quarter of an inch in thickness. The only recognisable object contained in the left ventricle was the choroid plexus, which was considerably enlarged, congested, and lay, as it were, in a depression or fissure between two eminences of the opaque matter referred to. At its origin within the ventricle, at the posterior or superior cornua, it was covered, and where it passes through the foramen communis inferior in the healthy subject, in the present instance possessed an unusually strong attachment to some object occupying a position in the mesian line, surrounded by a cloudy mass of the same matter, which was connected to and occupied the space of the left ventricle, extending from the pillars of the fornix, posteriorly and superiorly, anteriorly or inferiorly to the genu of the corpus callosum, and laterally within the *right hemisphere and ventricle* to the inferior cornua and base of corpus striatum, all of which, with the fifth ventricle and septum lucidum, were obliterated.

The choroid plexus of the right side was congested, and contained a few particles of calcareous matter, and the ventricle a small quantity of fluid, but in other respects appeared normal.

The greater portion of the matter was removed from the surface of attachment of the choroid plexus, when an irregular ovoid mass presented itself, about the size of a pigeon's egg, imbedded in the elastic mass, with which it was united as if in the process of accumulation; it was raised from its position by the forceps, drawing with it a considerable amount of surrounding matter, and being deprived of which, had all the physical characters of a cartilaginous tumour.

In length it was about an inch, the breadth about five-eighths,

the long axis being across the mesian line, and greater portion *within the left ventricle*.

I have endeavoured to illustrate this interesting subject by means of drawings made from a horizontal section of the two lobes, and a vertical one of the left.

Here I would inquire, as blindness succeeded in gradual terms to the progress of disease, would it be produced by direct pressure from the diseased portion within, over the decussating optic nerves, or, is it more probable that the thalamus opticus and other parts within the left ventricle being implicated in actual disease would develop the symptoms?

---

*Melanism and Softening of the Medulla Oblongata.*

THIS also was a case which was brought before the notice of Mr Thompson. The history is as follows:—The animal, a gray cart-mare, the property of Joseph Scott, Esq., Southwick, near Sunderland, was about sixteen years old, and had been in possession since she was four years old, during which time, up to a period of twelve months ago, she had always appeared in perfect health. About the time mentioned, the spine, particularly the dorsal portion, assumed a greater curvature, as indicated by the hollow back, falling back of the withers, &c. Symptoms of vertigo gradually presented themselves; and upon several occasions, after staggering a few paces, she fell with extreme helplessness to the ground, but almost as soon rose, and resumed her walk as before. By degrees the respiration was affected, and ultimately became thick; and during the attack stertorous.

Being an old favourite, the animal was allowed to go on light work, the nature of the affection, for some time, not apparently needing assistance; but the fits of vertigo becoming more frequent, and their influence more powerful, the animal was sent for examination, and, if a possibility of good arising, for treatment. The age of the patient, coupled with the following symptoms, induced Mr Thompson to advise her being destroyed, which was done on the 16th of March last.

The head was held low, and carried in that position when at work,—in the stable she would support it by resting the under jaw upon the manger.

The pulse exceedingly slow and weak, but full and compressible, numbering not more than 18 beats in the minute; appetite good, and other functions apparently normal, except the respiration, which, as previously stated, was thick, heavy, and stertorous. There was a peculiar disregard to all that was passing around, the ears were motionless, and harsh treatment produced no extraordinary excitement; all activity and energy was absent. The sensitiveness of the muscles over the dorsal, thoracic, and pectoral regions, completely gone, and throughout the body there was a soft



flabby sensation under the fingers. There was a peculiar stepping short with the extremities, particularly the fore, the limbs being put down with a heavy thud, as if the want of nervous power existed to direct the placing of the member. If the animal was brought suddenly to a stand tremors commence, slight at first, but by degrees increasing in intensity. She staggered and fell as if shot, the whole of the limbs being doubled underneath the body. These symptoms had increased during the few previous weeks to such an extent, that the poor creature would fall two or three times a day.

A knotted and irregular fulness exists in both parotid glands, particularly the left; the nodules, varying in size, were attached to the skin, but unconnected with glandular structure, as indicated by their mobility. The salivary secretion was not known to be impaired or otherwise.

Owing to circumstances of an uncontrollable character, the head, together with the first, second, and third cervical vertebræ, were the only portions which were saved from the ruthlessness of a knacker, of which I have attempted to give a brief description.

When the parts were separated, about half an ounce of serum escaped from the spinal chord, which was observed to be altered in structure.

The brain was next carefully removed, when its entire substance and meninges were found to be congested, the capillaries being beautifully delineated, and the large vessels stretched, thinned, and transparent. The general substance of the cerebrum and cerebellum was found to be quite healthy. The ventricles contained a very minute quantity of fluid, and the choroid plexus of each enlarged, congested, and possessed an accumulation of calcareous matter as large as a medium-sized hazel nut; the smaller granules which made up the whole being about the size of a lentil.

The medulla oblongata, as it leaves the cerebellum, only exhibited signs of disorganisation; its internal structure was softened, pulpy, and not unlike a mixture of the medullary and cortical portions of the brain when mixed up with a spatula. In fact the integrity was so far destroyed down to the point where it was cut off at the third vertebra, that its own weight was sufficient to destroy its form, and the mass oozed from the membranes like curds.

When the parotid glands were exposed, melanotic tumours presented themselves situate between the sulcæ of the glandular structure, which was displaced; those in the left were as large as a walnut.

The tonsils were enlarged, the investing membrane thickened, rough, and studded with numerous eminences not unlike grains of sago in size and appearance; they were not injected, but the

whole, with adjacent parts, including the pituitary membrane, the eyes, and their appendages, much paler than natural.

---

*Remarks on the foregoing Cases.*

Amongst some half dozen or more cases which have occurred in my practice, where tumours have been found within the brain, or its substance interfered with by a process of diseased action in connection with, or independent of abnormal growths, I have met with none where the organ was so extensively disorganised, as in the instance of the black horse just related; and in comparing such, both with regard to their outward and physical indications, as well as their inward morbid condition, as usually met with, to others in which the various parts have undergone such extensive derangement, one cannot but feel greatly surprised to witness the few symptoms which mark the real amount of disease actually going on within, in the latter, and the vast interference in such as the former, with natural habits and functional arrangements, where those symptoms are exceedingly violent and actual disease apparently trifling.

We may be excused somewhat for the want of accuracy which characterise our diagnosis of these diseases, occasioned probably by the nature, habits, and requirements of our patients, and the paucity of general information on the subject; but I am inclined to the belief, that attentive observation of the symptoms manifested during life, especially if the patient has been known for a lengthened period to the practitioner, with a careful examination of the affected parts after death, a great deal would not only be revealed thereby, but more would become of paramount importance: certain morbid appearances will be seen to depend upon some unusual indications and physical signs, which, as they reveal themselves under peculiar phases and conditions, may at least render an estimate more decisive, if not absolutely perfect. In these particulars we must undoubtedly experience the value of association.

At our periodical meetings, the bringing forward of such accounts which I have on this occasion attempted, with, I must say, neither the erudition nor the attainments which such subjects require, have only sincerity for their recommendation. Coupled with the valuable echo, which resounds from the pages of our representative journals, cheering us onward as the career seems blighted and cloudy, dispelling, as it were, the mists of doubt and uncertainty, and the cordial assistance always rendered by the publication of our transactions and papers on various subjects, it is thus that the profit must become mutual in proportion to our estimate of the worth, and as our ideas are made known and commented upon by others; and only by close investigation, comparison of facts, and carefully dealing with them,



together with the priceless assistance which is to be obtained from fellowship, and operations of minds determined on good, can such results as those wished for be obtained.

Professor Dick is well known to pourtray to his class a succinct, but lucid description of these affections, as they have occurred on an almost indefinite field of practice, extending over a lifetime, the value of which is too great to be forgotten.

Mr Barlow too, under whom I had the honour, and likewise the privilege to graduate, developed a priceless eloquence on their nature and peculiarities. It was during the summer of 1851, when almost alone in Clyde Street, I experienced an inexpressible delight in assisting at dissections and drawings of diseased specimens, which are still fresh in my memory, together with the profitable remarks which always attended such pleasant occupations; and since have borne so effectively on subsequent proceedings.

From cases which now and then occur, a great deal might be gathered, and here I would suggest the urgent propriety of chronicling faithfully the details—not merely in our private case books, but in our recognised journals—for the interest and benefit of brethren at a distance; but I am digressing; and to resume, would remark again, how great a difference has been found to exist in the character of some of the cases, not widely different in their real nature; as for instance those in which softening—or “*Ramollissement*,” as preferred by erudite authors—exists alone; and others where the prevailing signs are dependent on the presence of atheromatous, fibrous, or other tumours within the organ, separately, or in conjunction with softening.

A large black Hanoverian horse, which from his manner was unapproachable, and pronounced by several to be phrenitic, being destroyed in consequence, the brain came into my possession, and fully occupying each lateral ventricle, attached by a pedicle to the choroid plexus, was a pyriform tumour of a fibrous nature. Here the brain was perfectly healthy in appearance, but pressure by increase of size in the tumours, causing the mischief, had produced considerable absorption and consequent obliteration of the various objects usually described as forming the ventricles.

A bay cart mare, whose peculiar exhibition of symptoms had gained for her the title of “a shiverer,” after death showed softening of the brain and presence of pulpy matter in the ventricles, similar to the case described at the commencement of this paper. Others might be adduced, but sufficient has already been cited to establish the fact of the existence of two kinds of disease of the brain, but symptoms indicative of such are by no means regular. Our first case is characterised by violent actions under certain conditions, with a constant and peculiarly excitable nature, blindness gradually but completely setting in. The “Shiverer” however, with a greater amount of softening, displayed no symptoms of such a nature. Such we should consider to be an

unerring indication of disease involving the optic nerve, its commissure origin, or perhaps altogether, and in the absence of those impetuous bursts of violence, might infer softening had taken place. Yet there is no paralysis, or loss of sensation in the body, which so eminently characterise the second case; and how the functions of respiration, digestion &c., in this instance were carried on, is a matter of no little perplexity, without naming the great dependence upon that wonderful object, the sympathetic nerve, which Sir Charles Bell has considered to be a nervous system in itself.

There are other cases also, which being characterised by symptoms of violence at periodical times during life, have shown no indication of the presence of tumours within the organ after death; but when a termination has suddenly resulted. An attempt has been made to account for it, from the detection of sanguineous sugillations, which are regarded as capillary hæmorrhage within the softened portions, under which circumstances the blood-vessels, probably containing a material deficient in elaborating properties,—themselves wanting in integrity, in common with the surrounding parts,—are rendered more liable to the effects of an over distended stomach, tight collar, &c., and other causes by which the circulation within the brain is accelerated or increased, whereby rupture takes place, producing results of various degrees of importance.

We have the authority of Dr R. B. Todd, F.R.S., for the following statement, in reference to the softening of the brain. “Without waiting,” says he “to decide upon this point,” *i.e.*, whether the disease depends on a depraved condition of the brain-fibre, or brain-cell or otherwise, a presence of atheromatous deposits within the minute vessels;—“we may, then, lay it down that, whether in consequence of the disease of the blood-vessels or otherwise, the nutrition of the brain becomes impaired, and this shows itself mainly in an altered consistence of the nervous matter. Its colour does not undergo any appreciable alteration, and if you look at a portion through the microscope you will not detect any obvious change, the vesicles remain the same, and the fibres remain unchanged; but, as I said, the consistence is diminished,—instead of being firm, the tissue of the organ has become soft and pulpy, and in some cases almost diffuent, and of the consistence of cream.

“The diseased blood-vessels lie in the midst of this pulpy mass for some time without undergoing any further change, but sooner or later, under some mental emotion, or during some increased heart’s action, depending either upon mental emotion, upon derangement of the digestive organs, some bodily exertion, or increased mental effort of any kind, the blood is sent with undue force, or in undue quantity, into the vessels, and in consequence the vascular canals in the pulpy portion of the cerebral tissue being deprived of their usual support, give way, and blood is



effused into the softened part of the brain, which it breaks up, and the more readily, in consequence of its already diminished consistence." (*Braithwaite's Retrospects of Medicine*, vol. xxxi., 1855, page 74.)

I cannot conclude these remarks without referring to the report of a valuable paper on Tumours in the Brain, read before the Imperial and Central Society of Veterinary Medicine in Paris, by M. Leblanc; and published in the "*Veterinarian*," page 162 of the March Number for 1855, a perusal of which will not be without interest.

A short discussion followed the reading of the paper, and a vote of thanks was proposed to the president and authors respectively, and cordially agreed to.

Copies of the papers, with an abridgment of the transactions of the meeting, were ordered to be forwarded for publication in the "*Veterinarian*" and "*Edinburgh Veterinary Review*."

A sub-committee, consisting of Messrs Hunting, Scott, Fairbairn, Armatage, Peele, and Thompson, was directed to meet on Saturday the 14th of May, at four o'clock, to arrange business, and appoint a day for the quarterly meeting in July.

Practitioners desirous of joining the Association should communicate with the Honorary Secretary.

---

*Professor Gamgee on "Breaking Down."*

TO THE EDITOR OF "THE SPORTING GAZETTE."

SIR,—My attention has been attracted to a paragraph in your "*Gazette*" of last week, which runs thus:—

"*Golden Pledge and the Chester Cup*.—We are requested to state that Golden Pledge met with an accident, for which Mr Field, of Oxford Street, attended him. He found that the horse had badly strained the *suspensory ligament* of his near fore-leg. . . . The horse will necessarily be useless for racing purposes, and Captain King has parted with him."

I have nothing to remark on the fact of the horse having sustained injury, nor yet on the possible extent of it; neither do I, through envious feeling towards a highly respected and privileged member of the veterinary profession, take up the question.

A few words in season are better than a volume written out of time. It is not that there is anything new afforded by the character ascribed to the injury which Golden Pledge has sustained that I notice it, but because it is an old and oft-repeated tale, that I expose its erroneous import.

I have discovered, demonstrated, and published the fact of there being no such structure as a suspensory ligament in the limb of the horse, or, so far as I know, in that of any other animal. Nor is there any other ligament, tendon, or analogous structure,

endowed with properties and functions such as have been attributed by those who adopt the groundless notions on the point. Once the correct anatomical and functional phenomena are established, prevailing ideas on the diseased states of the parts will disappear. Not every reader, I am aware, will at first appreciate the merits of the questions involved. Some may think that one opinion is as good as another; while the majority, I hope, will investigate the grounds on which opinions stand.

Not a great many years since, it was customary, in speaking of the structures behind the shank-bones of both fore and hind legs of horses, to call them, altogether, the "back sinews." And though vague, the words conveyed no erroneous meaning; but it was bad for the horse when men were permitted to cloak incompetence under the assumed mantle of science, and give erroneous names to component structures of the animal, in accordance with their strange speculative notions about the office or functions of parts.

Three-quarters of a century ago, horses in all respects like Golden Pledge could run for King's Plates, carrying 12 stones each, over four miles courses, in heats, and many of them were in training at eight years old; whilst they walked from one race meeting to another, in distant parts of England. It is very remarkable to see how people close their eyes when the true phase of a subject is presented; how the truth becomes explained away, and how, in drawing comparisons, degeneracy of breed in our horses has to bear the blame of all present lack of successful training-on, in all but a fractional few exceptional animals.

We might search the studs of England over for years, and not see a colt more likely to make a lasting good horse, for any purpose, than Golden Pledge. My own business, however, in this matter is to declare that there is no such structure, with the character and functions attributed, as that called the suspensory ligament; and dismissing all dispute about the name, I assert, on proved knowledge, that the texture, supposed to be a suspensory, and to be the common seat of strain, is almost, if not entirely, exempt from strain, as it is destined for altogether opposite functions to those ascribed; and I hold that veterinarians have no right to follow a myth, to the neglect of rational investigation, any more than the members of the medical profession may play with serious matters. It is not enough to say that the horse has injured some part of the leg; the precise structure should be known, and whether that structure be the primary or secondary seat of injury, the nature and cause of which, again, should be known; and these phenomena all traced out, lead to an understanding of causes, preventive measures, and the best remedies.—I am, Sir, your obedient servant,

JOSEPH GAMGEE, Sen.

Lecturer on the Structure, Economy, and Diseases of the Foot  
of the Horse and Teacher of the Art of Shoeing at  
the New Veterinary College, Edinburgh.

April 18, 1864.



# EDINBURGH VETERINARY REVIEW

AND

## Annals of Comparative Pathology.

---

### CHRONIC LAMENESS.

IN another part will be found some queries by Mr Owles, to which Mr Gamgee has appended his replies. And we report a case, with results, and such remarks as seem called for, believing that it is one of those calculated to throw light on the subject to which the correspondence noticed refers.

The case, illustrative of our doctrine and practice, and which we are induced to relate, in the belief that it may interest readers who reasonably look for substantial evidence in the shape of practical results, happened at the New Veterinary College.

The subject was a black mare, bought by us at the Lothian Road Auction Mart, on the 11th November last, for the price of L.6, when very lame on both fore feet. The mare was bought on the impromptu of the moment, with the intention of submitting her to treatment, under observation. No opportunity being afforded to see the state of the animal beyond her general appearance, diagnosis of the pathological condition of the feet had to be gone into, after, instead of before purchase, as would have been the better way, if time had permitted.

It was at once made clear that the case was one of very protracted and advanced atrophy of both coffin-bones, and ulceration of the navicular bones. The neck, shoulders, and bosom of the animal were spare of muscle ; her hoofs were pared to the quick, and soft as a piece of wet parchment ; the shoes on the feet showed a relative want of understanding on the part of the shoer with that which the general management of the case exhibited.

We at once took off all the shoes, equalized the bearing points of the feet, and put the mare into a loose box, with dry and clean bottom, viz., flat pavement, slightly littered over. When the feet were dry, ointment was rubbed into them all over, and the mare was, for an hour daily, with liberty to take voluntary exercise, turned loose into the Riding School attached to the Infirmary.

Each succeeding day showed that the pain in her feet was subsiding, and at the end of a week we shod her, when the improvement in her going was at once very manifest. She was then ridden in the School, and, two or three days after, put in single harness, and went freely, without showing any obvious signs of lameness.

The mare continued to be driven almost daily, sometimes in rather a heavy brougham, at other times in a lighter two or a four wheeled vehicle. When in the latter she was usually driven faster. Without any material change in the treatment and management of the mare during upwards of four months we kept her, beyond duly attending to the shoeing, there was nothing to note. As is our practice in all cases, we looked to that essential part, the shoeing, rather frequently, because, with progressive augmentation of hoof, new advantages are gained, therefore we do not wait to get the amount of horn required, which would take six months or more, but keep the whole in the best proportion the structures admit of; in the mean time, as well as working in harness, the mare was several times lent to ladies to ride. Our opinion never altered as to the amount of disease present in the pedal and navicular bones; and though great and rapid results had been brought about, without waiting for the hoof to become equal to its full functions or the bones to recover much of their healthy state, the mare was put at ease, she increased in breadth of forehead, and her whole appearance became changed, from that of a haggard animal, to an aspect of thriftiness and ease. Still, we could not pronounce her capable of sustaining very trying work up to the time she was under our care, and on two occasions she was lame after long journeys in the country, when she was driven hard and drew heavy weights.

On both occasions the shoes were taken off, and the feet were fomented two or three times in warm water; we waited for the circulation to find its equilibrium, and when the pain had passed off, the hoofs, gradually developing, admitted of improvement in shoeing, and the mare went on progressing well.

At length, having no requirement for the mare, and the experiment having served its purpose, it was determined on to send her back to the Auction Mart, whence she came, and accordingly on the 23d of March she was sent, without recommendation beyond that which her state afforded. The history of the animal



had become pretty well known. L.10 was given for her, and as soon as she had passed from us, the purchaser resold her to a friend of the auctioneer's for L.15.

The gentleman who bought the mare for a riding nag, went on using her with complete satisfaction, kept her at livery, at the sale stables, and for some days we heard nothing but highly satisfactory reports ; when at length, at the expiration of a fortnight, the mare was for sale again ; after a little inquiry on our part, it turned out that she was lame. The stable-master stated, *that knowing her previous state, every care had been taken to prevent recurrence of the lameness. And that her feet had been constantly stopped, and wet swabs had been applied to her coronets every night.*

To avoid mistake, we went to the stable, took the mare's feet up, and found that, additionally, she had been shod. Which of the several things done contributed most to reduce her to such a state of misery as that in which we again found her, so that she was not able to stand up to the manger to eat her food, we will not stop to inquire ; it is enough for our present purpose to adduce the instance, to show the contrast.

I need scarcely say that the mare has continued lame ; and though offered again several times at the auction, no bid has been obtained ; and as a matter of course she is lame, and will suffer until the slaughterer's knife relieves her, since those who are credited for some knowledge about horses cannot see that a rational procedure restores, and the opposite destroys.

What would not a human patient exclaim in favour of the surgeon who relieved his painful condition, to the extent we did that of this mare ? If it be said that we had not brought the mare back in the brief period to her primitive state ; we say that much was effected, and the animal was made of real and increasing value for given purposes. Our practice has this peculiarity in it, that we do not begin by torture,—like that of giving a man a black-eye for the sake of seeing it return to its normal colour again,—but we set out by the sweeping away of causes, and the removal or allaying of pain.

## ROYAL COLLEGE OF VETERINARY SURGEONS.

—o—

## GENERAL MEETING OF COUNCIL.

At a Quarterly Meeting of the Council held on the 6th day of April 1864,—

PRESENT:—The President, Professors Simonds and Gamgee, Messrs Braby, Broad, Dickens, Ellis, Harrison, Hunt, Lawson, Moon, Secker, Silvester, Wilkinson, Withers, and the Secretary.—The President in the Chair.

The minutes of the preceding meeting were read and confirmed.

Letters were read from Professor Brande and Dr Struthers relative to the meeting of the Court of Examiners.

It was moved by Mr Braby, and seconded by Mr Silvester—“That the London examinations should take place on April 21st, 22d, and 25th and 26th.”—Carried.

It was moved by Mr Wilkinson, and seconded by Mr Dickens—“That the Scotch examinations should commence April 26th, and be continued on following days.”—Carried.

Letters were read from Edward Holland, Esq., M.P., relative to the Veterinary Medical Bill.

The Cattle Diseases Prevention Bill was next read.

A long discussion ensued relative to the appointment of Veterinary Surgeons as Inspectors, and a wish was expressed that the Council should watch the course of the Bill before the Committee of the House.

It was moved by Professor Gamgee, and seconded by Mr Harrison—“That a Committee of the Council be appointed to represent to Government the importance of modifying Part IV. of the Diseased Cattle Act, to secure that the cattle inspectors should be persons having the advantage of a regular veterinary education.”—Carried.

It was then moved by Mr Silvester and seconded by Mr Braby—“That the Committee consist of the President, Messrs Field, Mavor, Wilkinson, and the Secretary, with power to add to their number.”—Carried.

The Finance Committee reported that they had examined the vouchers and receipts of payment during the preceding quarter, which were found to be correct. The Committee also submitted the quarterly balance-sheet of the treasurer's account, from which it appeared that the liabilities for the quarter ending April 1 amounted to L.71, 6s. 9d., which they recommend should be discharged.

It was moved by Professor Gamgee, and seconded by Mr



Secker—"That the Report from the Finance Committee be received and adopted."

On the report of the Committee appointed for the alteration of bye-law twenty-one, it was resolved—"That the following notice of motion be suspended in the board-room for three months.—Each section of the Court of Examiners shall have a Chairman and a Secretary.—The Chairman of each division of the Court shall be elected by and from amongst its members. The Secretaries shall be appointed by the Council."

The Council also gave instructions that the two new bye-laws which had been confirmed should be now duly signed and sealed in accordance with the provisions of the charter.

Copies of the bye-laws were also ordered to be printed.

The arrangements for the forthcoming annual meeting were considered, when it was moved by Professor Simonds, and seconded by Mr Lawson—"That the same gentlemen constitute the Committee for preparing the Annual Report as last year—viz., The President, Messrs Wilkinson, Harpley, Braby, and the Secretary."—Carried.

It was moved by Professor Simonds and seconded by Mr Hunt, "That Mr James Broad and Mr J. R. Cox be appointed auditors."—Carried.

A discussion next ensued relative to the Anniversary Dinner.

It was moved by Mr Silvester, and seconded by Professor Gamgee—"That the London Tavern be selected."—Carried.

It was also moved by Mr Hunt, and seconded by Mr Broad—"That the Medical Examiners be invited to attend."—Carried.

It was farther moved by Professor Simonds, and seconded by Professor Gamgee,—“That the incidental expenses of invitation to the Medical Examiners be paid out of the funds of the College.”—Carried.

The following gentlemen agreed to constitute the Dinner Committee—The President, Messrs Braby, Harpley, Moon, Silvester, Wilkinson, Withers, and the Secretary.

Cheques were ordered to be drawn for the current expenses.

By order of the Council,

WM. HENRY COATES, *Secretary*.

---

#### SPECIAL GENERAL MEETING OF COUNCIL.

At a Special Meeting of the Council, held 20th April 1864.

PRESENT:—The President, Professor Spooner, Messrs Braby, Harrison, Moon, Pritchard, Wilkinson, Withers, and the Secretary.—The President in the Chair.

The minutes of the preceding meeting were read and confirmed.

Letters were read from the Medical Examiners, regretting their inability to attend at the Anniversary Dinner.

The Dinner Committee reported to the following effect,—viz. that arrangements had been made for the dinner to take place at the London Tavern, precisely at 6 o'clock P.M., Tickets L.1, 1s. each, including wine, &c.

A letter was read from Mr Parsons of Launceston, a practitioner of several years' standing, who was desirous of becoming a candidate for the Diploma of the College, asking whether he could present himself for a practical examination only.

It was moved by Mr Pritchard, and seconded by Mr Braby—“That the Secretary be instructed to write to Mr Parsons, and inform him that bye-laws No. 27 and 29, requiring the production of a certificate from one of the schools, could not be departed from.”—Carried.

A letter was received from Mr Jex, tendering his resignation as a member of the Council, was next read.

It was moved by Mr Moon, and seconded by Mr Braby—“That the Secretary be instructed to inform Mr Jex that his resignation was accepted with much regret.”—Carried.

A letter was read, which had been received from Mr Holland, M.P., asking to be informed of the period of attendance which is required as constituting a regular veterinary education before a diploma is granted by the Royal College of Veterinary Surgeons, in order to the naming of such persons in the bill now before Parliament for the prevention of diseases among cattle, as being only eligible as inspectors at fairs and markets.

The Secretary informed the Council that he had supplied the information required.

A further discussion took place relative to the Bill now in Committee of the House, on Cattle Diseases, when the Secretary was desired to obtain information from Professor Simonds, with regard to the proceedings of the Committee, so as to provide for a deputation to wait upon Sir G. Grey, or Mr Bruce.

The Balance Sheet of the Receipts and Expenditure during the past year, as audited, was laid on the table; also the Annual Report of the Council, as prepared by the Committee.

The Report being amended, it was moved by the President—“That it be received and adopted.”—Carried.

By Order of the Council,

WM. HENRY COATES, *Secretary*.



## REPORT OF THE COUNCIL OF THE ROYAL COLLEGE OF VETERINARY SURGEONS, FOR THE YEAR 1863-64.

YOUR Council reports that at its first Meeting the following gentlemen were elected, viz.:—Wm. Ernes, Esq., President, and Messrs M. J. Harpley, C. Dickens, W. G. Goodwin, W. Aitken, Edwin Harrison, and B. C. R. Gardiner, Vice-Presidents. Mr W. H. Coates as Secretary and Registrar.

The Inquiry Committee brought up its report recommending that a bill should be prepared for presentation to Parliament for improving the position of veterinary surgeons, upon which a special committee was appointed for carrying out the above recommendation, and a bill was accordingly prepared, entitled "The Veterinary Medical Act," which having been duly revised was submitted to Mr Garrard, the legal adviser of the College, for his opinion and returned by him to the Council in the following form:—

"WHEREAS her present Majesty, by Royal Charter bearing date the 8th day of March, in the seventh year of her reign, did for herself, her heirs and successors, grant unto Thomas Turner, and to certain other persons therein named, together with such others as then held certificates of qualification to practise as veterinary surgeons, granted by the Royal Veterinary College of London, or by the Veterinary College of Edinburgh respectively, and such other persons as respectively then were and might thereafter become students of the Royal Veterinary College of London, or of the Veterinary College of Edinburgh, or of such other veterinary college, corporate or incorporate, as then was or thereafter should be established for the purposes of education in veterinary surgery, whether in London or elsewhere in the United Kingdom, and which Her Majesty and her successors should under her or their sign-manual authorise in that behalf, and should pass such examination as might be required by the orders, rules, and bye-laws which should be framed and confirmed pursuant to that Charter, should, by virtue thereof, be members of and form one body politic and corporate, by the name of "The Royal College of Veterinary Surgeons," by which name they should have perpetual succession and a common seal, with full power and authority to alter, vary, break, and renew the same at their discretion, and by the same name to sue and be sued, implead and be impleaded, and answer and be answered unto, in every Court of Her Majesty, her heirs and successors, and be for ever able and capable in the law to purchase, receive, and possess to them and their successors any goods and chattels or other personal property whatsoever, and should have full power and authority to sell and dispose of any goods and chattels or other personal property so to be by them acquired, and to act and do in all things relating to the said body politic and corporate as fully and effectually to all intents, effects, constructions, and purposes whatsoever, as any other of Her Majesty's liege subjects, or any other body politic and corporate in Her Majesty's United Kingdom of Great Britain and Ireland, not being under any disability, might do in their respective concerns; and Her Majesty did further declare and grant that the veterinary art, as practised by the members of the said body politic and corporate, should be thenceforth deemed and taken to be and recognised as a profession, and that the members of the said body politic and corporate, solely and exclusively of all other persons whomsoever, should be deemed and taken and recognised to be members of the said profession or professors of the said art, and should be individually known and distinguished by the name or title of Veterinary Surgeons.

"And in the said Charter were contained certain regulations for the conduct and management of the affairs of the said Corporation.

"And whereas it is expedient that such of Her Majesty's subjects as may from time to time require veterinary medical aid should be enabled to distinguish the members of the Royal College of Veterinary Surgeons from others who have not passed the examination requisite for entitling them to become

members of the said College, and who are not members thereof:

“ BE IT ENACTED by the Queen’s Most Excellent Majesty, by and with the advice of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows :

“ I.—This Act may, for all purposes, be cited as the Veterinary Medical Act.

“ II.—This Act shall take effect from the First day of October, One thousand eight hundred and sixty-four.

“ III.—Any person, not being a member of the said Royal College of Veterinary Surgeons, who shall, after the time appointed for this Act coming into operation, take or use the name or title of Veterinary Surgeon, or who shall falsely represent himself to be a member of the said College, or who shall use any other name or title with intent to lead, or whereby the public may be led to believe that he is a member of the said Royal College of Veterinary Surgeons, shall upon a summary conviction, for any and every such offence, pay a sum not exceeding ten pounds, nor less than five pounds.

“ IV.—Provided, nevertheless, that this Act shall not affect any person who shall, prior to the First day of October, One thousand eight hundred and sixty-four, have assumed the name or title of Veterinary Surgeon, and at the period last mentioned shall be actually in practice as such.

“ V.—Any penalty to which, under this Act, any person is liable on summary conviction of any offence, may be recovered as follows (that is to say) : in England, in the manner directed by the Act of the Session holden in the eleventh and twelfth years of her Majesty, Chapter XLIII. ; and in Ireland, in manner directed by the Petty Sessions (Ireland) Act, 1851 ; or any other Act for the time being in force in England and Ireland respectively for the like purposes. And any such penalty may, in Scotland, be recovered by the Procurator-Fiscal of the county, or by any other person, before the Sheriff or two Justices, who may proceed in a summary way, and grant warrant for bringing the party complained against before him, or them, or issue an order requiring such party to appear on a day, and at a time and place, to be named in such order ; and every such order shall be served on the party by delivering to him in person, or by leaving at his usual place of abode, a copy of such order and of the complaint whereupon the same has proceeded ; and upon the appearance or default to appear of the party, it shall be lawful for the Sheriff or Justices to proceed to the hearing of the complaint, and upon proof or confession of the offence, the Sheriff or Justices shall, without any written pleadings or records of evidence, commit the offender, and decree him to pay the penalty named, as well as such expenses as the Sheriff or Justices shall think fit ; and failing payment, shall grant warrant for the recovery thereof by pounding and imprisonment, such imprisonment to be for such period as the discretion of the Sheriff or Justices may direct (not exceeding three calendar months), and to cease on payment of the penalty and expenses.

“ VI.—Any sum or sums of money arising from conviction, and recovery of penalties as aforesaid, shall be paid to the Secretary for the time being of the said Royal College of Veterinary Surgeons, for the use of the aforesaid College.

“ VII.—Any person, being a member of the Royal College of Veterinary Surgeons, actually practising, shall be exempt from serving on all juries and inquests whatsoever.”

From the protracted discussion and the legal opinion that had to be taken, the time for the notice of introducing it as a private bill into Parliament had elapsed, and it would have to be postponed for another year ; it was therefore deemed desirable by the Executive to take steps to introduce it as a public bill. Notice was given to that effect to the House by the Hon. Member for Evesham, the grounds for introducing it as a public bill were as follows :—

“ *First*, The object of this Act is to protect the public from a deception practised on it by certain parties assuming the name and title of Veterinary Sur-



geon, to which they have not the slightest right or claim. This, by misleading persons in quest of veterinary medical aid, is calculated at times to cause great losses to the owners of live stock. To the veterinary profession it is of great consequence, not only in a pecuniary point, but also affecting the reputation of the profession generally.

“*Secondly*, The name is of comparatively recent date, it having been introduced simultaneously with the Veterinary Colleges, and was first exclusively assumed by those who had graduated at these establishments, and certainly does not belong to persons who have neither devoted time nor money to the acquirement of veterinary science. Moreover, there is no hardship in it, for the Act does not affect those in actual practice at the time it would come into operation. It is simply prospective, and its effect would be to cause all future candidates of the veterinary art to study at one or other of the Veterinary Schools, of which there are now three, and a fourth one is in contemplation.

“*Thirdly*, Though Veterinary Schools have now been established above sixty years, the number of veterinary surgeons is under 1000, while the number of veterinary empirics is more than three times that number, evidently showing that in the present state the veterinary profession, if not stationary, is not increasing with the population, and that unless something is done to check this abnormal state of things, Veterinary Schools will be very much at a discount. Veterinary surgeons are now principally located in the large towns, few venture into the rural districts, on account of the opposition of the numerous empirics they would encounter, and who are generally the first to attend the maladies of domestic animals; and if the veterinary surgeon is sent for, the case is but too often beyond all chance of recovery, it having been too long tampered with by the empiric; but let the veterinary surgeon beware ere he prescribes, for he is sure to get the blame, for if the patient recovers, the empiric spreads about that his treatment, and not that of the veterinary surgeon, has effected the cure; if, on the contrary, the patient dies, which in nine cases out of ten will be the case, the empiric says, “The veterinary surgeon has killed him; if he had remained under my care and treatment he would have recovered;” in support of which, he has twenty cases to quote, which in his opinion were worse, and which he has cured. But even the large towns are not free from this pestilence, for almost every shoeing smith has, if not Veterinary Surgeon, Veterinary Forge written on his sign-board, and undertakes to shoe and doctor horses by contract, and has horse and cattle-medicines. By the same reason, a boot and shoe maker might be considered competent to medically treat his customers—nothing can be more ridiculous.

“*Fourthly*, Would epizootic maladies have prevailed to the extent and fatality as is now, unfortunately, the case, had the veterinary profession been on a better footing, and more numerous? It may be safely asserted that whatever they, the veterinary surgeons, have attended, they have always devised the means of preventing the spreading of epizootics, by recommending *sequestration, quarantine, &c.*, while the unscientific empiric is slow in diagnosing the malady, and never doubts of curing it. Another important question is the cruelty from which unscientific practice can hardly ever be considered free. The Act for Prevention of Cruelty to Animals justly punishes for ill-using domestic animals, but the veterinary empiric may bleed them to death, nauseate them with the most pungent nostrums, perform the most barbarous and useless operations with impunity. The very names by which many diseases are known, are a proof of the ignorance of these pretenders, as, for instance, the braxy, the gid, black quarter, quarter evil, stricken, even murrain, which is a general designation for all maladies of an infectious type, is simply derived from the Latin *mori*, to die.

“*Fifthly*, Almost every country has laws more or less stringent against veterinary empiricism. In France it is illegal for any one not having obtained a diploma to assume the name of veterinary surgeon; the penalties are heavy—damages and interest to the aggrieved parties. In Belgium, where Veterinary Schools are little more than a quarter of a century old, a law passed in



1850 prohibits any one from practising the veterinary art who has not a diploma. In Holland, a similar law is in force. In Saxony it is decreed that only those who possess diplomas as veterinary surgeons have the right to treat the maladies of domestic animals. In Bavaria it is promulgated by law that no person shall practise the veterinary art unless provided with a diploma. In the grand duchy of Baden there is a decree against empirics; the penalties are heavy fines and imprisonment. All the small states of the German Confederation have enactments more or less severe against veterinary empiricism.

"A similar law would be a great advantage to this country, which possesses the finest breed of horses, cattle, sheep, &c., in the world, and to the veterinary surgeon it would give the status to which he has a just right."

In the last Annual Report, reference was made to the course which the Council has taken with a view of giving practical effect to the obvious meaning of that part of the Royal Charter which states, that the members of the College have the exclusive right to the title of Veterinary Surgeon, and of obtaining exemptions from serving on juries, &c.,—rights which the large obligatory expenditure in money and time entitled by a College professional education gives the graduate a fair and just claim to, and rights which the public is clearly entitled to, and should have secured to it, by such a well-defined line of demarcation as would distinguish the educated veterinary surgeon from the pretender. The Council, inspired with a desire to fulfil its obligations to the body corporate, has, during the past year, continued its earnest and anxious endeavours to arrive at a favourable accomplishment of the task it has before it; but, although it has not lost the hope of ultimate success, it has found the affair beset with difficulties of various weight. The legal advisers do not offer a favourable opinion on the propositions which have been laid before them. Parliament, uninfluenced by the vast advantages which Continental nations have derived from, firstly, educating and then protecting veterinary surgeons, may lend but a feeble encouragement to the profession whilst struggling for a national object. These two obstacles, however, are dwarfed to insignificance by a more damaging influence, which paralyses the best efforts; and that is a state of disunion which, for some reasons, offers a positive opposition to the desiderated advance of our professional and social status.

The Council would therefore propose that each Member of the College should take an early opportunity of ascertaining the feeling of the Members of Parliament who represent his county or borough, and, if possible, secure his vote and support in the House of Commons when the bill is presented; and that when he has had an interview, he should communicate the result to the Secretary of the College.

Your Council regrets to have to announce that two important Members of the Court of Examiners have, during the past year, tendered their resignation, viz., Messrs Quain and Field; these vacancies were filled up by the election of Professor Ellis of the University College Hospital, and that of Professor W. J. T. Morton.

The Council has found it necessary to make alterations in some of the bye-laws, which have been duly sealed and printed.

Copies of the new register have been sent gratuitously to masters of hounds throughout the United Kingdom, in order that gentlemen seeking professional aid might be able to recognise those who are members of the body corporate. According to the Registrar's Report, the number of deaths that have occurred during the past year were 13. Amongst its number, the profession has sustained a great loss by the death of Professor Renault, Inspector of the Imperial Veterinary School of France. During the same period, 90 pupils have obtained the diploma of the Royal College of Veterinary Surgeons.

The Museum has received, during the past year, some very valuable contributions in the beautiful anatomical preparations which have been presented by Messrs Goodwin and Jex.

The financial statement is annexed. The balance in hand, after defraying the expenses of the year, is L.420.



E. BRABY, Treasurer, *in Account with* THE COUNCIL OF THE ROYAL COLLEGE OF VETERINARY SURGEONS, *April 1864.*

<i>Dr.</i>			
Balance at Bankers', April 1863	.	.	£294 14 8
Examination Fees	.	.	686 14 0
Copies of Register	.	.	10 2 0
Interest	.	.	9 1 2
Income-Tax returned	.	.	1 15 0
Discount on Coal Account	.	.	0 8 0
			<hr/> £1005 14 10

<i>Cr.</i>			
Examination Fees and Expenses	.	.	£255 9 10
Rent	.	.	60 0 0
Rates and Taxes	.	.	30 19 10
Allowance to E. N. Gabriel	.	.	50 0 0
Salary to Secretary	.	.	50 0 0
Insurances	.	.	4 14 3
Advertisements	.	.	10 14 11
Printing	.	.	17 13 0
Diplomas	.	.	8 12 0
Coals, Gas, and Wood	.	.	11 12 0
Stationery and Stamps	.	.	16 13 4
Museum	.	.	6 1 2
House Repairs	.	.	6 13 9
Furniture	.	.	14 10 0
Wages	.	.	20 0 0
Petty House Expenses	.	.	22 0 9
Balance at Bankers	.	.	420 0 0
			<hr/> £1005 14 10

We, the undersigned, have examined the above accounts, and found them correct.

JAMES C. BROAD, } *Auditors.*  
JOHN ROALFE COX, }

April 15, 1894.

MEETINGS OF SOCIETIES.

THE YORKSHIRE VETERINARY MEDICAL SOCIETY.

THE above Society held its Quarterly Meeting at the St George's Hall, Bradford, on Monday, 11th inst. The following gentlemen were present :—The President, Mr E. C. Dray, Leeds ; Messrs Secker, Knaresborough ; Falding, Wakefield ; Anderton, Skipton ; Broughton, Leeds ; Cuthbert, Leeds ; Carter, Bradford ; Smith, Barnsley ; M'Taggart, Halifax ; Lord, Halifax ; Kay, Pontefract ; Bale, Otley ; Naylor, Wakefield ; Paterson, Dewsbury ; Howell, Rochdale ; Greaves, Manchester (President of Lancashire Veterinary Medical Society) ; Horne, Barnsley ; and the Secretary. Four new members were elected,—viz., Messrs Howell, Rochdale ; Smith, Barnsley ; Sampson Wood, Moor Town, Leeds ; and Austin, Huddersfield.

After the preliminary business was concluded, Mr SECKER read an excellent paper on Laminitis, prefacing his essay by paying a high compliment to the

members upon the inauguration of the Society, hoping that their labours would be crowned with success, promising that he would do his utmost towards that end. He said that laminitis was a disease which the horse, as an animal of speed and weight, was most liable to, considering the concussion to which the feet are subjected, the application of iron shoes, and the abuse of the drawing-knife. Referring to the disease in other animals, Mr Bell, of Lancaster (the Essayist said) had seen it in cattle. In his own practice, he finds well-bred horses, having strong upright feet, oftener affected than others. He then divided the disease into three classes, and portrayed the acute as the most painful ailment that affects the horse. After minutely describing the symptoms, he went on to the causes, and in doing so stated, that although what is termed metastasis was sometimes a cause, he believed that many cases ascribed to it have been laminitis from the commencement. As one of the terminations, he stated that he had seen mortification in two or three instances. Treatment recommended,—bleeding, cathartics, alkaline carbonates—a certain deobstruent, poultices to the feet, attention to the general comforts of the animal, &c. In the discussion, the Secretary said he could not understand the term metastasis as such; he thought all cases ascribed to this cause were due, not to a transference of the disease, but that irritation of the mucous membrane extended through the medium of the skin to the laminæ of the feet, they being folds of the derma confined within the horny box, and, in support of his views, called the attention of the members to the irritable condition of the skin in laminitis—believed the irritation to be general, and to exist throughout the mucous membrane primarily affected, skin and laminæ—objected to drastic cathartics, but was in favour of mild laxatives, alkaline carbonates, &c.

Mr GREAVES objected to large doses of cathartic medicine, and to warm applications to the feet, and brought before the notice of the members thirty-one morbid specimens of diseased pedal bones, kindly sent to him by Professor Gamgee expressly for the Bradford meeting. There was an animated discussion for and against the Messrs Gamgee's views on the pathology of diseases of the feet. In all probability this will be laid before the profession *in extenso*, as Mr Greaves has proposed since the meeting, to the Secretary, that they should discuss this matter in a series of friendly letters.

Mr NAYLOR said, that in his practice he found that horses with weak feet and heels were the most susceptible to disease, and had been most successful with horses having good strong feet—had seen the disease as a sequel to parturition—condemned setons in the active stage.

Mr CARTER allowed that in those cases said to be due to metastasis there was great irritation of the skin—recommended slings when the animal will not lie down. Mr M'Taggart applied poultices containing arnica, and recommended homœopathic remedies. Mr Cuthbert applied cold poultices, and bleeds, but did not approve of strong cathartics; blistered after the acute symptoms had subsided. Mr Broughton and Mr Lord agreed in their method of treatment.

Mr HOWELL said that most cases arose from indiscretion in feeding, most particularly from feeding on wheat,—in such cases gives cathartics and carminatives, and bleeds largely from both brachial veins.

Mr SECKER then replied, and maintained his opinion as to the administration of strong cathartics, and that strong feet were most liable to the disease—that weak feet were more yielding, and consequently more easily affected by warm poultices, which he preferred to cold. He spoke at some length, entering into the views of the members who had spoken.

The PRESIDENT, in closing the discussion, said, that the raspings of the hoof was often a cause of the disease, the hoof consisting microscopically of tubes hermetically sealed, &c.; approved of topical bleeding, but not from the toe; condemned cathartics; upheld the theory of metastasis as generally understood, and agreed with the essayist that the strong hoof, and horses of high action, were most liable; objected to frog setons; recommended the treatment pursued by the essayist, with the exception of strong cathartics, to the serious consideration of



the members, well knowing that Mr Secker was a gentleman eminently successful in his treatment, and that he had arrived at his conclusions after well matured study, great experience, and careful thought,—concluding his remarks by proposing a vote of thanks to the essayist. This being seconded by Mr NAYLOR, was carried with applause.

The unanimous thanks of the Society were accorded to Professor Gamgee for his kindness in sending the specimens above referred to.

The next meeting of the Society will be held at Harrogate, on Monday, July 11th, at 1.30 P.M., when Mr Naylor will read a paper.

W. WILLIAMS, Bradford, *Hon. Sec.*

## NORTH OF ENGLAND VETERINARY MEDICAL ASSOCIATION.

### HONORARY SECRETARY'S OFFICIAL REPORT.

THE Quarterly Meeting of the above Society was held on the 15th inst., at the Crown and Thistle Hotel, Groat Market, Newcastle-upon-Tyne, when there were present,—Mr C. Hunting, President, in the Chair; Messrs M'Gregor, Seaton Delavel; L. Scott, Hetton; T. Thompson, Sunderland; T. Foreman, Shotley Bridge; H. Hunter and C. Stephenson, Newcastle; D. Dudgeon, Sunderland; J. Peele, Durham; A. Mann, sen., and A. Mann, jun., veterinary student, Lambton; and Honorary Secretary.

Mr J. Peele and Mr J. C. Hubbick (Hubbick and Peele, Durham), and Mr A. Mann, jun., veterinary student, were admitted members of the Society.

The usual preliminary business of the Society being disposed of, Mr T. Thompson, Sunderland, read a paper on Tetanus, which appears in another part of the Review.

## PERISCOPE.

### BRONCHITIS IN THE OX.

(*From the Scottish Farmer and Horticulturist, 2d March 1864.*)

BRONCHITIS in the ox is usually a mild affection, but a knowledge of its symptoms is of no small importance to the stockowner, from the facility with which these may be confounded with those of epizootic pleuro-pneumonia. The first is a simple inflammatory affection, which, under proper treatment, will generally terminate favourably in the course of a week or a fortnight from its onset, while the second not only proves fatal in many cases to the subject first attacked, but is invariably pregnant with danger to all with which the latter may come in contact.

The custom of slaughtering animals affected with pleuro-pneumonia has become so all but universal, and the dread of this malady is so constantly present to the mind of the stockowner, that it need not be wondered at if cattle suffering from milder ailments, and especially such as implicate the respiratory organs, are hastily doomed to the knife, and parted with at a ruinous sacrifice.

Bronchitis essentially consists in an inflammation of the delicate mucous membrane lining the bronchial tubes or air passages within the substance of the lungs. The whole length of the windpipe is usually slightly inflamed in this disease, and the larynx is likewise not unfrequently affected. The affection is less common in oxen than in horses, the former being less frequently subjected to exciting causes, such as sudden chills when heated, severe exertions, and various other contingencies.

Debilitated animals may be considered as the most likely subjects of this disease, but of all predisposing causes none is more prolific than an antecedent bronchitic attack, which leaves the greatest susceptibility to a subsequent one.

The common immediate or exciting causes may be ranged under the heads of undue exposure and the direct contact of irritants with the delicate bronchial mucous membrane.

An ox subjected to sudden changes of temperature, turned out of a warm byre or shed to the piercing blast of early spring, kept in a situation much exposed to north or east winds, or made to stand in a draught, is very liable to be thus affected.

On the other hand, the disease may be caused by the inhalation of irritant vapours, such as chlorine gas; or, as in the case of a fire, of carbonic acid and smoke; or, further, by the introduction of solids or irritating liquids into the air passages.

The cause last named is sometimes witnessed as a result of the careless administration of drenches to cattle. The liquid passes, as the saying is, down the wrong way—in other words, enters the windpipe in place of the gullet; and the animal may fall down suffocated from spasmodic closure of the larynx, or it may be only seized with violent paroxysmal coughing, rapidly followed by the symptoms of bronchitis or inflammation of the lungs. The best way to avoid such a mishap is to give cattle medicines in a large quantity of water or other bland liquid, to pour it out slowly, and to let down the head the instant an attempt is made to cough.

Bronchitis, like inflammatory affections generally, is ushered in by general febrile symptoms, such as slight shivering, staring coat, languor, diminished appetite, suspended rumination, slight costiveness, some redness of the mucous membrane of the eye, and increase in the force and frequency of the pulse. This form, which marks the onset of the malady, is much less active than in similar conditions in the horse, and is indeed often entirely overlooked.

The symptoms soon become more marked. The pulse is stronger and more frequent, the mucous membranes acquire a deeper red, the muzzle is warm and dry, the mouth hot and clammy, the expired air feels warmer than natural, and the breathing becomes deeper and more hurried, being attended by an unwonted lifting of the flanks. The fæces are scanty, hard, and covered by a mucous film. The cough at this stage is highly characteristic; it is not loud, but dry, hard, and painful, seeming to come from the depth of the chest. The ear applied over the lower end of the windpipe detects a loud sonorous noise, altogether unlike the healthy sound, and caused by the air rushing through the narrowed tubes, the coats of which have become thickened and dry. An analogous sound is heard on applying the ear to the chest just behind and rather below the middle of the shoulder blade. A wheezing noise may be heard over the other parts of the chest, especially when the smaller bronchial tubes are implicated. On striking the various regions of the thorax on both sides with the closed fist, the patient usually grunts, but a hollow resonant sound is emitted, as in striking the healthy chest; this shuts out the idea of inflammation of the lungs. These methods of examination by the ear and hand, to be satisfactorily carried out, require considerable experience in the examination, not only of diseased chests, but also of healthy ones. Nevertheless, when properly and intelligently employed, they afford the most satisfactory evidence of the condition of the thoracic viscera.

On the second or third day the symptoms become modified. The depression is greater, the breathing more laboured, and often accompanied by grunting, the mucous membranes may be of a darker hue, and the pulse softer and weaker. The cough becomes soft and rattling, or gurgling, and a whitish muco-purulent fluid runs more or less freely from the nose. All this depends on the abundant secretion within the bronchial tubes, which partially obstructs the passage of air, and in bad cases and weak patients may threaten suffocation. If now the ear is applied over the lower end of the windpipe, or behind the



shoulder, the rude sonorous breathing is found to have given place to a peculiar gurgling sound, caused by the air rushing through the abundant secretion, and the bursting of numerous mucous bubbles. This is modified, as might be expected, by the varying size of the bubbles in the larger and smaller bronchial tubes, and also on the consistency of the exudation.

If well managed, the crisis is often reached on the fourth or fifth day, from which time recovery may be dated. Pure and uncomplicated bronchitis in cattle will usually end favourably. The worst form is that in which the smallest air-tubes are implicated, since it is liable to be attended by a more viscid exudation, which blocks up the tubes and greatly impedes respiration. In such a case it is also now likely to be complicated with inflammation of the lungs.

*Treatment.*—Mild attacks taken early may be successfully treated on hygienic principles alone. Give a comfortable warm loose box, the air of which must be maintained as nearly as possible at a uniform temperature, sheet the animal, and give sloppy diet, such as boiled roots or scalded bran.

Acute attacks will require, in addition, more active treatment; but as a rule, pure bronchitis sustains badly any violently depressing measures. Bleeding can only be ventured on in the strong and well-conditioned animal, and even then when the pulse is strong and the fever of a high type. An aperient, consisting of twelve ounces of epsom salts and half an ounce of ginger may be given. Sloppy mash may be allowed, and well-boiled linseed gruel *ad libitum*. In the latter may be added nitre, which should not exceed, however, one ounce daily. After the bowels have operated, a mustard poultice may be beneficially applied to the sides of the chest, and only removed when a considerable exudation has taken place beneath the skin. When the cough is severe, anodynes may be called for; but until the expectoration is abundant, the most common of these—the opiates—are very objectionable.

Every case presents peculiarities which must be specially combated; and the owner will best consult his own interests by seeking for all but the mildest cases the best professional skill within reach.

---

## THE LYMPHATIC RADICLES IN THE KIDNEYS OF THE MAMMALIA.

(From the *British and Foreign Medico-Chirurgical Review*, April 1864.)

C. LUDWIG and TH. ZAWARYKIN, in a brief introductory note, state that the lymphatics of the kidney arise from the connective tissue described by Bowman, Goodsir, and Henle, that is, out of the spaces, which, in all parts of the cortical and medullary substance, lie between the blood and urinary vessels. These spaces cannot only merely be injected from the larger lymphatics by taking certain precautions, but they are also always and equally distended when, in the living kidney, the larger branches are filled with lymph, and an œdematous swelling has been produced. The urinary and blood-vessels are imbedded in the root spaces of the kidney-lymph, just as is the case with the seminal and blood-vessels in the like named spaces of the testicle. The transference of the lymph from the roots into the little stems, is also effected in the kidney as in the testicle; this can be especially well shown in the lymphatics which take their origin in the capsule. Here, also, the layers and fibres of the connective tissue serve as auxiliary means to conduct the finest chasms into closed "vessel-courses." The difference in this respect, between the capsule of the testicle and that of the kidney, seems particularly to be due to the lesser thickness of the covering of the latter. Inasmuch as, in consequence of interruptions in the currents of urine and blood, the lymph-work of the kidney swells considerably, and the whole kidney is greatly enlarged, and inasmuch as in such cases also the

primitive lymph-spaces may be filled with blood, and lymph-corpuscles with fat and pigment, the lacunar system, which, after our experiments and injections, we must consider as the lymph-roots, has not been overlooked by the pathologists. Thus, among others, is Beer, who, in his monograph on the connective substance of the human kidney (Berlin, 1859), gives representations of these lacunæ, filled with the matter above mentioned, but there is no question that they are in connection with the lymph-vessels.

---

### ON CONNECTIVE TISSUE.

(From the Same.)

TOMSA makes the following observations:—If the lacunæ of connective tissue were injected by means of punctures, or from the lymphatics, the connective tissue corpuscles were never suspended in the injection mass itself, but generally in close vicinity to the cavities, indeed, very frequently as if intergrown with the coat of the pale, connective-tissue limit. If the nuclei yet showed themselves imbedded in larger number within the bundles of connective tissue, then it was to be considered that what is called a coarser bundle may be divided into thinner partial bundles, to the interstices of which the connective-tissue corpuscles stand in an equal relation. Whilst an abundant injection of the cavities unfolds these relations, the connective-tissue corpuscles are rather heaped up together in empty lacunæ, as if imbedded in the interior of the connective tissue of a coarse bundle.

---

### FORMATION OF THE SO-CALLED INTERCELLULAR SUBSTANCE OF CARTILAGE, &c.

(From the Same.)

DR BEALE has written to prove the following propositions:—"1. That the so-called intercellular substance of cartilage and other tissues, is never formed independently of *cells*, or, more correctly, masses of living or germinal matter. 2. That the intercellular substance does not possess formative power, and that physical and chemical changes alone take place in it. 3. That in all cases the masses of germinal matter are continuous with the so-called intercellular substance, and that the latter was once in the state of germinal matter. 4. That in the development and growth of these tissues, the pabulum becomes (*a*) germinal matter; the germinal matter becomes (*b*) the formed material (intercellular substance), which accumulates and gradually undergoes condensation."

---

### PARAPLEGIA IN THE COW.

(From the *Scottish Farmer and Horticulturist*, March 16, 1864.)

PARAPLEGIA, or paralysis of the posterior extremities, is occasionally seen in dairy cows; and, when occurring immediately after parturition, is sometimes mistaken for parturient fever, or "dropping after calving." Almost the only common symptom, however, is the loss of power over the hind limbs, the others seldom homologate each other in the two affections. Parturient fever is characterised by a strong hard pulse at the outset, followed by stupor, general loss of sensibility, and reckless tossings of the head; while in paraplegia, the pulse and general constitution are often little if at all affected, the sensibility of the hind legs only is impaired or lost, and the frantic movements are altogether wanting. The former, moreover, is essentially a disease of plethoric animals, and affects almost exclusively good milkers that have been well kept and fed on



an abundance of nourishing food up to the time of parturition and subsequently ; such as are, accordingly, in the best condition, have already borne three or four calves, have calved easily, and have had no untoward, depressing, or weakening sequel. The latter is quite as common in the young or the aged as in those in the prime of life, in the badly-kept and emaciated as in the well-fed and plethoric, and is more likely to follow a difficult than an easy parturition. Besides, the common symptom of loss of muscular power is not peculiar to these affections. In almost all serious ailments occurring in the cow about the time of parturition, the same symptom is met with. In most severe inflammations, whether of the respiratory, digestive, or generative organs, the cow goes down, and remains so until some amelioration has taken place.

Paralysis not unfrequently occurs in cows during the last two months of pregnancy. Its onset is more common two or three days before calving, but especially so during or within fifteen days after that process. The functional activity of the posterior part of the spinal marrow during gestation, and more particularly during the expulsion of the calf, seems to predispose it to take on a morbid process. It is a law of the animal economy, that when any organ is excited beyond its normal standard, its excitability is to the same extent exhausted, and a proportionate depression is certain to ensue. The vitality of the part, and its power of resisting the causes of disease, being thus diminished, any morbid influence exerted on the system at large will tend to localise itself in its weakened structure.

The common exciting causes of the affection are an overloaded and constipated state of the bowels, and exposure to cold and wet. The first cause is noticed in animals feeding on an insufficient diet, of bad quality, and of a hard fibrous consistence, the evil effects of which are often enhanced by hard or stagnant water. Exposure is the most prolific cause of this complaint. It attacks principally cattle kept in situations that are much exposed to north and east winds, and when they are turned out of a warm cowhouse and allowed to remain until completely chilled. A damp, badly-drained byre has a similar tendency, more especially if a stream of cold air is allowed to fall upon the subject. Cold, backward springs are especially prolific of the affection. Some cases occurring at the time of calving depend on injury to the great sciatic nerve within the pelvic cavity during the progress of the calf through the anterior passage. Such instances follow difficult parturitions.

The symptoms vary much in the early stage of the disease. In some cases the subject has muscular twitchings or shiverings, especially of the hind limbs ; the latter become weak and unable to support the body ; there is a staggering gait, and in a few hours the animal is down and incapable of rising. In other cases, the malady comes on slowly, and is exhibited at first by weakness of the posterior extremities and vacillating movement, as if affected by sprain of the loins. At this time there is usually much tenderness of the loins, and on their being pinched, the animal bends down to evade the hand, and not unfrequently moans. This may go on for seven or eight days, the weakness meanwhile gradually increasing until the limbs are no longer able to support the body. The control over the fore limbs is usually preserved, and upon these the animal raises itself ; and in its struggles to get upon the hind legs, rolls from one side to the other, but seldom succeeds in getting the hocks from the ground.

In the worst cases, the temperature of the paralysed limbs is reduced, though more commonly it remains of about the normal standard ; and, as a rule, after the animal is down, any frequency or hardness of the pulse which may have previously existed, together with the tenderness of the loins, gradually pass off. From this time the symptoms are confined almost entirely to the paralysed limbs ; the heart's action and that of the lungs are healthy, appetite good, rumination regular, and digestion nearly perfect ; the last gut alone is torpid, and the fæces are often unduly retained. Less frequently there is also retention of urine.

The animal may remain down for weeks, or even a month or two ; and in

proportion to the duration of the paralysis will be the muscular wasting of the limbs, this being simply a result of their inactivity.

Sometimes the palsy becomes general, and in such a case is speedily followed by death, the brain being implicated.

When the disease occurs before parturition, it often interferes with that process. The womb, like the intestine, is in a torpid condition; its weakened contractions do not efficiently second those of the muscles around the abdomen, and parturition becomes slow and difficult. When the labour pains have commenced, it is often necessary to dilate the neck of the womb with the hand, to rupture the membranes, to apply cords over the fore-feet, and to employ force in extracting the calf. The rule, however, should never be forgotten to employ only moderate and steady traction, and this during the throes of the animal alone. It must be sought at the same time to support the animal, by giving two or three bottles of strong ale or other stimulant.

Treatment is most satisfactory in young and vigorous animals, in which the disease is ushered in by general excitement, muscular tremblings or twitchings, and tenderness of the back and loins. In old or debilitated subjects, in which there is gradually increasing feebleness without constitutional excitement, it is much less amenable to treatment.

The patient must be supplied with a dry, warm, and comfortably-littered box, well clothed, and have active frictions with wisps of straw over her hind limbs. If the costive state of the bowels seems to have been an active cause of the disease, a smart purgative, consisting of  $1\frac{1}{2}$  lb of Epsom salts, a dozen croton beans, and an ounce of ginger, may be given, though in other cases milder doses may be employed, so as to keep the bowels in a relaxed condition. Fomentations or emollient poultices should be applied along the spine. The condition of the bladder should be carefully ascertained, and the urine drawn off with a catheter if found necessary.

After the tenderness of the back and the constitutional excitement have subsided, a mustard poultice may be applied over the spine in place of the fomentations.

In many cases, *nux vomica* given in 2-dr. doses proves eminently beneficial; but this agent is so violent in its action, that it can only be safely administered under the immediate superintendence of a professional man. Moreover, if given at too early a stage, while any inflammatory action exists in the spinal marrow, it will only tend to aggravate it and to hasten a fatal termination.

---

## LIEBIG AND THE "MINERAL THEORY."

(From the *Journal of the Royal Agricultural Society of England*, Vol. xxiv. Part 2, 1863.)

THE terms "mineral" or "inorganic," as applied to the constituents of manures or crops, are, for convenience, employed throughout this paper to designate the incombustible or "ash constituents," they having been generally employed in this restricted sense by Liebig and most other writers on agricultural chemistry during the last twenty years or more. Yet, in his recent work (*Einleitung in die Naturgesetze des Feldbaues*, p. 32 *et seq.*) Baron Liebig repudiates and ridicules such a classification as unscientific, claims ammonia and its salts as mineral manures, and accuses Mr Lawes of setting up, in opposition to his own, a theory according to which mineral or inorganic manures should contain only incombustible or ash constituents. To support this allegation, he gives, in a separate paragraph, and in italics (*Sperrschrift*), the following sentence as a quotation from Mr Lawes's paper on "Agricultural Chemistry," vol. viii. p. 240, of this Journal:—

"Manures are generally divided into two classes, organic and inorganic. Organic manures are those which are capable of yielding to the plant, by decomposition or otherwise, carbon, hydrogen, and nitrogen. Inorganic manures



are those substances which contain the mineral ingredients of which the ash of plants is found to consist."—[Translation.]

But the following is the passage as it really stands at the page referred to by Baron Liebig, and the portions given in capitals are those which are omitted by Baron Liebig in his professed quotation :—

"I NOW COME TO THE ACTION OF MANURES, WHICH are generally divided into two classes—*organic* and *inorganic*. ALTHOUGH THIS DISTINCTION IS BY NO MEANS SATISFACTORY, I SHALL ADOPT IT AS BEING GENERALLY UNDERSTOOD. Organic manures are those which are capable of yielding to the plant, by decomposition or otherwise, ORGANIC MATTER—carbon, hydrogen, oxygen, and nitrogen—CONSTITUENTS WHICH UNCULTIVATED PLANTS DERIVE ORIGINALLY FROM THE ATMOSPHERE. Inorganic manures are those substances which contain the mineral ingredients, of which the ash of plants is found to consist."

Here, then, in this which was Mr Lawes's first paper, the classification which Baron Liebig accuses him of originating is only adopted as being already at that time "generally understood," and with a distinct protest that it is "by no means satisfactory." Yet, in order to fix the origination of the distinction upon Mr Lawes, Baron Liebig joins together disconnected parts of a passage, and gives them, in a separate paragraph, in italics (*Sperrschrift*), and between unbroken inverted commas, omitting (besides less material portions) an entire sentence which distinctly disproves the truth of the allegation in support of which the professed quotation is brought forward! Having thus moulded Mr Lawes's sentence to suit the requirements of his argument, he goes on to say :—

"From this doctrine of the practical man it necessarily followed that a mineral manure must be one which contained *only* the ash-constituents of vegetable products, and from the composition of which ammonia-salts, as belonging to organic manures, are excluded. To be sure, in every chemical manual, ammonia and its salts are treated of among inorganic substances, since they are objects of chemical manufacture, whilst organic matters cannot be produced by man; and this fact might well have led to the suspicion that ammonia was not necessarily excluded from an inorganic manure. The agricultural chemistry of the practical man was evidently a peculiar chemistry, which had no connection with ordinary chemistry, and thus *his* theory might well find some justification; but, according to *my* theory, I obviously took another point of view. Mr Lawes, indeed, mentions in his paper (p. 21,) that my manures smelt of ammonia, and hence contained an ammonia-salt; but he implied that this might be a little artifice, in order to give to my manures an efficacy which, according to his interpretation of my theory, they should not possess."—[Translation.]

The following quotations, taken from several of Baron Liebig's works, will show whether he has not been accustomed to use the terms "mineral" or "inorganic" to designate the incombustible or ash-constituents, and to distinguish these from "ammonia," "ammoniacal salts," "atmospheric constituents," &c. The italicising is our own :—

"The *mineral* constituents act, as is shown by the produce of the unmanured land, without any artificial supply of *ammonia*."

"The *ammonia* increases the produce only if the *mineral* constituents be present in the soil in due quantity, and in an available form.

"*Ammonia* is without effect if the *mineral* constituents are wanting. Consequently, the action of *ammonia* is limited to the acceleration of the action of the *mineral* constituents in a given time."—*Principles*, pp. 86–7 (1855).

" . . . . . the other is the action of *sulphate of ammonia* as a solvent for certain important *mineral* constituents of the soil."—*Ib.*, p. 99 (1855).

"*Ammonia*, when used as a manure alone, and when there is a want of *mineral* constituents in the soil, is like the spirits which the labourer takes in order to increase his available labour, power, or imagination; and, like that stimulant, its action, in this case, is followed by a corresponding exhaustion."—*Ib.*, p. 106 (1855).



"Hence it is quite certain that in our fields the amount of nitrogen in the crops is not at all in proportion to the quantity supplied in the manure, and that the soil cannot be exhausted by the exportation of products containing *nitrogen* (unless these products contain at the same time a large amount of *mineral* ingredients), because the *nitrogen* of vegetation is furnished by the atmosphere, and not by the soil. Hence, also, we cannot augment the fertility of our fields, or their powers of production, by supplying them with manures rich in *nitrogen*, or with *ammonia salts* alone. The crops on a field diminish or increase in exact proportion to the diminution or increase of the *mineral substances* conveyed to it in manure."—4th Edition. p. 210 (1847).

"But, at the same time, it is of great importance for agriculture to know with certainty that the supply of *ammonia* is unnecessary for most of our cultivated plants, and that it may be even superfluous, if only the soil contain a sufficient supply of the *mineral* food of plants, when the *ammonia* required for their development will be furnished by the atmosphere."—4th Edition, p. 212 (213).

"A fertile soil must contain in sufficient quantity, and in a form adapted for assimilation, all the *inorganic* materials indispensable for the growth of plants.

"A field artificially prepared for culture contains a certain amount of *these ingredients*, and also of *ammoniacal salts* and decaying vegetable matter."—4th Edition, p. 169.

"The meaning of these sentences in my work is this:—'that *ammoniacal salts* alone' have no effect; that, in order to be efficacious, they must be accompanied by the *mineral constituents*, and that the effect is then proportional to the supply—not of *ammonia*, but of the *mineral substances*."—*Principles*, p. 55 (1855).

"These two paragraphs are altogether irreconcilable; for if Mr Lawes admit that the *mineral* constituents are indispensable to plants, how can he maintain that these very *mineral* constituents are replaceable by *ammonia*; that is to say, that by means of ammonia we can altogether dispense with them?"—*Principles*, p. 89 (1855).

"It has been mentioned in the preceding part of the chapter, that animal excrements may be replaced in agriculture by other materials containing their constituents. Now, as the principal action of the former depends upon their amount of *mineral* food so necessary for the growth of cultivated plants, it follows, that we might manure with the *mineral* food of wild plants, or, in other words, WITH THEIR ASHES [the capitals are Baron Liebig's own]; for these plants are governed by the same laws, in their nutrition and growth, as cultivated plants themselves."—3d Edition, p. 183 (1843).

"But the weight or amount of the crops is in proportion to the quantity of food of both kinds, *atmospheric* and *mineral*, which is present in the soil, or conveyed to it in the same time. By manuring with *ammoniacal salts* a soil rich in available *mineral* constituents, the crops are augmented in the same way as they would have been if we had increased the proportion of *ammonia* in the air."—*Principles*, p. 77–8 (1855).

These sentences will be sufficient to show whether or not Liebig is justified in now attempting to fall back, in agricultural discussions, upon the more strictly scientific meaning of the terms "mineral" and "inorganic," so as to include within them "ammonia," "ammoniacal salts," "atmospheric constituents," &c., and thus to give a new definition to his mineral theory, or rather substitute at this date for his own theory, which has proved to be erroneous, another not his own.

## FOREIGN BODIES IN THE STOMACHS OF RUMINANTS.

(From the *Scottish Farmer and Horticulturist*, March 23, 1864.)

By foreign bodies we mean, firstly, such solid agents as are taken into the stomach with the food or otherwise, and are incapable of undergoing digestion, and, secondly, concretions which are formed within the stomach itself from the



gastric contents. These bodies are almost exclusively met with in the first stomach, or paunch, and the second stomach, or honeycomb bag. These viscera occupy three-fourths of the whole abdominal cavity; in which they are placed, to the left side of the two last stomachs and the intestines. The paunch, which is slightly flattened from above downward, and divided into a right and left sac by a deep notch at each extremity, lies somewhat obliquely from above downward and to the right, so that its inferior surface is in contact with the lower and left parts of the abdominal walls. The honeycomb bag is lodged in front of the left sac of the paunch, in contact with the diaphragm or midriff, and covered by the lower part of the short ribs on the left side. The internal cavities of the two organs communicate freely with each other through a large orifice, so that the one might be considered as a special compartment of the other, placed at its anterior extremity, and but very imperfectly separated from it. The contents are common to the two, and pass freely from the one into the other. The lining membrane of the paunch is covered by papillary processes, especially long at the two extremities, and in the right sac; while that of the honeycomb bag is thrown into a number of ineffaceable folds, which divide the whole surface into a series of cells strongly resembling those of a honeycomb, only larger and shallower. This reticulated structure, which has given its name to the organ, is liable to entangle in its meshes any hard and pointed body that may have been taken in with the food.

The first and second stomachs are not essentially digestive cavities, but simply temporary receptacles for the food, and especially the hard solid parts of it, until time may be allowed for its remastication, and gradual digestion in the fourth stomach, which is the true digestive cavity. The principal changes that the food undergoes in the first two stomachs are, the solution of its sugar and other soluble ingredients in the saliva and secretions of the organs, the gradual disintegration of the food by continual agitation in contact with heat and moisture, and the partial change of its starchy constituents into dextrine and grape sugar. The trituration to which the food is subjected in the manyfolds is likewise preliminary to true digestion; but the ingesta only gains this organ after having undergone a sufficient comminution in the first two stomachs, or after it has been subjected to the second and thorough mastication. Moreover, all food must pass through the third in order to reach the fourth stomach, and we thus see why foreign bodies are much less frequently met with in these.

Among the agents which the animal takes in along with its food we meet with the greatest variety. They consist of sand, stones, needles, pins, nails, bones, old shoes, articles of wearing apparel, &c. Some of these may escape detection during the rough primary mastication to which the food is subjected, and be swallowed inadvertently; but more frequently they are chewed and swallowed as an act of mere wantonness on the part of the animal. This is more especially noticed in dairy cows, which seem especially subject to attacks of depraved appetite, but is by no means uncommon also in oxen or young cattle.

The second class of foreign bodies referred to consists of hair balls, and of the same or other objects surrounded by an encrustation of calcareous matter, the surface of which is often smooth and glistening.

The hair balls seem to be due to the animal licking itself, or performing the same kind office for its fellows. The hair dislodged by the rough tongue of the animal is carried into the stomach with the saliva, and by the churning action of that organ is rolled into a solid pellet. The contents of the stomach are often more or less abundantly mixed up with hair, and the whole bound together by a quantity of mucus. As more hair is swallowed, new layers are from time to time deposited on the surface of the mass, and it may thus attain a very considerable size. When these hair balls are developed, as they sometimes are, in the fourth stomach, they are usually composed more exclusively of hair, as the fibrous parts of the food are mostly disintegrated before reaching this organ. In either case, their encrustation with earthy salts only commences when the hair is no longer being deposited on the surface, and the thickness of this encrusta-



tion will vary with the length of time during which the sebo-dies remain in the stomach.

The external layer of earthy matter is of a dark brown colour, hard and resistant; but the whole body is extremely light, and on being cut in two is seen to have a pillous structure internally. The cut surface of the earthy matter is greyish-white. It consists of ammonia-magnesian phosphate, of phosphate and carbonate of lime, and of organic matter.

Many of these objects do little harm further than inducing a slight impairment of the digestive functions. Partial loss of appetite and irregularity of rumination, together with a tendency to gaseous distension of the belly, as soon as the animal has taken a small quantity of food, is a frequent index to the presence of an indigestible body in the paunch. This indication will be strengthened if there is no co-existing malady to account for the condition, and if the symptoms persist after the administration of a laxative and a course of tonics, together with a careful attention to diet and regimen.

In such cases, the beast will probably fatten, provided care is taken to furnish it at short intervals with highly nutritive food in small quantity; and if so, this is usually the best plan that can be adopted. If, however, the life of the patient must be preserved, the only effectual cure is by cutting down upon the stomach in the left flank, and extracting the offending body. If this operation is properly performed, the animal will, in the majority of cases, recover.

In some cases the effects are more injurious. A calf of a few weeks old, in the paunch of which we found a hair ball, of three inches in diameter, had suffered from obstinate scouring, gaseous distension of the belly after taking milk, rapidly increasing emaciation, weak and rapid pulse, pale mucous membrane, and great debility. These symptoms persisted in spite of all curative measures that were adopted, and the creature was ultimately destroyed.

Of the serious ailments, however, that result from such agents, the most common are those due to the sharp-pointed metallic bodies. These pass through the walls of the stomach, and most frequently of the honeycomb bag, in the cells of which they become entangled and penetrate the surrounding organs. In their passage they create inflammation, and cause the exudation of lymph, which surrounds the foreign body and usually prevents it from passing into the interior of any hollow cavity. These bodies will sometimes pass outward in the flank, or between the last ribs, and form a tumour under the skin, when they may be extracted by a simple incision, or allowed to stay until, by the absorption of the integument, they make their own way externally. In other cases, they become lodged in some internal organ, and are there enveloped in a fibrous or fibro-cartilaginous covering, which protects the surrounding organs from injury, and in this condition they will remain for years without further change. Not unfrequently, however, they destroy life by penetrating vital organs, and especially the heart. The proximity of the second stomach to the latter organ is doubtless one great cause of this, and the movements of the heart would seem likewise to have a strong influence in determining the course of the offending agent. In its course it is surrounded by the exuded lymph above referred to, and may induce symptoms of disease of the liver, lungs, pleura, pericardium, or other organ through which it may pass. Sometimes few symptoms are noticed until the heart has been reached, when the subject dies rather suddenly. More frequently there is cough, shortness of breath, palpitations, irregularity and other modifications of the heart's sounds, oedematous swellings under the chest and in the limbs, and great weakness and inability for exertion. After death, the course followed by the foreign body may be traced by the exudation which has taken place along its track.



## INFLUENCE OF PHYSICAL CONDITIONS OF SOIL ON THE APPLICATION OF AMMONIA AND PHOSPHATES TO TURNIPS.

(From the *Scottish Farmer and Horticulturist*, March 23, 1864.)

It is very common for writers on agricultural chemistry to assume that the turnip can draw a large supply of the nitrogen which forms its albuminous compounds by its roots from the rains, or by its leaves directly from the atmosphere. Were we aware how far we could rely upon these natural sources for ammonia, it would be a comparatively simple question how much of this substance we ought to give as manure. But this is a matter which is surrounded with greater difficulties than is generally supposed. It has been frequently assumed that the atmosphere supplies sufficient for the wants of the turnip if we furnish the necessary amount of phosphates and the other constituents which make up the ash. It is to some extent owing to the existence of certain vague and ill-grounded ideas on this question that we have recommendations for giving ammonical manures in sparing quantities to the turnip.

If we turn to direct experiments to guide us, we begin to realise the difficulties that beset us in dealing with this subject. Those of Mr Lawes do not by any means show that the turnip can absorb much nitrogen from the rains or from the atmosphere. Were we to apply the same reasoning to the turnip as he has done to the wheat plant, we do not think that his experiments furnish any evidence that the turnip can take from the atmosphere more nitrogen than would form from three to four tons of roots to the acre. These experiments were made on exhausted land, which was supplied with phosphates and alkaline matter. Pure superphosphates, which are entirely devoid of organic matter, are often sufficient to raise pretty full crops of turnips on land which is under a regular rotation of cropping. But on such land there is usually a large amount of organic matter in the soil, which yields up nitrogen to the plants. Dr Voelcker never could obtain twenty tons of swedes by the use of pure phosphatic manures in the numerous experiments he made. Very often, indeed, he did not obtain much more than the half this weight. It would have been interesting to have ascertained the weight of the crops on the same soils, after these had been exhausted by three or four crops of cereals in succession.

It is for many reasons very difficult and unsatisfactory to attempt to make any estimate of what amount of nitrogen turnips can take up from natural sources. Our experiments are usually made on good land under a regular course of cropping and manuring. We do not think, however, there is much evidence that the turnip, even in Scotland, where the conditions of growth are more favourable than in the south, will take more during a season's growth than from ten to twelve tons to the acre in any season. Of course, this is a mere guess; but we should be glad if our correspondents would favour us with any direct experiments bearing on this question.

We are informed that, on some of the larger farms of Berwickshire, where turnips are grown to the extent of one-fifth of the arable land, superphosphates from calcined bones are preferred, for raising swedes, to Peruvian guano or any other description of artificial manure. Nor is it difficult to understand how this should prove so effective a manure where the fifth rotation is so strictly carried out. The farmyard manure, instead of being freely diverted to the growth of potatoes, is all applied to the turnip. The land also remains two years in grass, and when under pasture it is probable that the soil stores up as much nitrogen every year from the atmosphere, and from the grasses and clovers, as it does from the turnip. Therefore these two sources would seem to supply about as much nitrogen to the soil as the turnip can economically use up. And, besides, large quantities of artificial food are consumed in the yards as well as in the fields, which all go to render direct applications of ammonia in artificial manures of less consequence.

The physical condition of the soil, too, it must ever be kept in mind, is one of the elements which regulates the quantity of ammonia that can be economi-



cally applied. Our chemists have never fully appreciated the simple principles that operate in such circumstances. Mr Lawes thought his experiments showed that Peruvian guano and other nitrogenous manures were best adapted for application on light soils. It is now, however, pretty well ascertained that the deeper, the richer, and the more argillaceous the soil, so much the more suitable is it for large dressings of ammoniacal manures. Dr Anderson at one time considered that the reason of light soils being less favourable for Peruvian guano, was on account of the guano being too easily washed out of such soils. It was forgotten that the moister the season the more suitable it is for such a manure. It is in dry climates and seasons that ammonia is not worked up on light lands; for the turnip being a thirsty plant, its water must be in some measure proportionate to its food. Were the turnip always to obtain a sufficiency of moisture on light lands, we may depend upon it that Bolivian guano would not have any marked superiority over Peruvian, however rapidly the "uric acid" of the latter might be decomposed. Dr Anderson's explanation, as given in his last lecture, cannot possibly be the right one, when it is remembered that the turnip can maintain itself as healthily in deep rich clay soils, when the nitrogen is applied as sulphate of ammonia or nitrate of soda, which are taken for granted to be more readily available. The Mid-Lothian experiments brought out this fact pretty fully. The true explanation is, when a turnip or any other plant absorbs more ammonia than it has moisture to maintain a corresponding amount of growth, a diseased condition at once ensues.

We ought also to keep in mind that it is not merely light and heavy soils in which the physical element comes into play. Shallow clay soils, or clay soils ill prepared for the turnip crop, are equally unfitted for the economical use of large quantities of Peruvian guano or other nitrogenous manures. Such conditions of soils are not adapted for growing full or maximum crops of turnips. They are as liable to suffer from drought as sandy soils, and in this case the crops do not thrive. Our liberal dressings of nitrogenous manures cannot be assimilated by the plants, and as a very natural consequence our returns are inadequate. We find that manures cheaper and less rich in so active a pabulum suit the purpose quite as well.

It has been long known that the fertility of soils is dependent on, or connected with, their hygroscopic qualities. The power which they have of drawing moisture from the atmosphere is closely allied to their powers of production. The deeper and richer the soils are the more are they fitted for turning to a profitable account large doses of ammonia when applied to turnips. This is sufficiently evident when we look to the results obtained on those soils which may be considered naturally the richest in Scotland. Mr Henry Stephens, in the January number of the "Journal of Agriculture," informs us that Mr Hope, of Pitfour Mains, in the Carse of Gowrie, obtained fifty-two tons of swedes to the Scotch acre by dressing with ten cwt. of Peruvian guano and ten cwt. of dissolved bones. Excepting that swedes had been as greedy of ammonia as they are of phosphates, how could they have withstood such an application? No cereal could have turned so large a quantity of nitrogen to so good an account. If we rely upon the writings of Way, Voelcker, Lawes, and Anderson, we would suppose that there is some deadly enmity between the turnip and nitrogenous manures. The flaw in their theorisings, however, is in dealing with half-crops or quarter-crops of the root. We must look to the two extremes—first, where the turnip is a short-lived and stunted production, as in the shallow soils of the south; and, second, where it is long-lived and of monstrous growth, as in the rich loams of our carse. It is thus evident that we must proportion the burden to the back which is to bear it, and not apply the heaviest and richest dressings to the weaker subject. It is too much to expect that the chemist can help us out in this matter; each must test the capacities of growth of soils for themselves.



*Annales de Médecine Veterinaire.* November 1863.

EXPERIMENTS ON THE UNION OF SENSITIVE AND MOTOR NERVOUS FIBRES. By M. GLUGE, Member of the Royal Academy of Sciences, and M. A. THIERNESSE, Member of the Royal Academy of Médecine.

IN a previous communication, the authors had sought to establish that the functions of sensitive and motor nervous fibres are inherent in the filaments, and do not simply depend on the nervous centres from which these fibres originate. They concluded, in other words, that a sensitive nerve-fibre is incapable of becoming a motor one.

Since then Phillipeaux and Vulpian have come to different conclusions, founded on the experiment of uniting the gustatory nerve (*nerf lingual*), to the hypoglossal. They state that four months after the operation, pinching of the cut end of the gustatory with a pair of dissecting forceps, determined contractions in the corresponding part of the tongue. In short, excitation of the sensitive fibres was transmitted direct to the motor fibres, and produced muscular contractions.

To further verify their previous conclusions MM. Gluge and Thiernesse made similar experiments on two dogs, one of a year, and the other six or eight weeks old. The first was operated on on the 29th January 1863, and the second on the 6th February of the same year. In each, the gustatory and hypoglossal nerves were laid bare and divided on the right side. About half an inch was then cut from the cranial portion of the hypoglossal, and its peripheral portion was then united by suture to the cranial portion of the gustatory.

The dogs continued to thrive well, but had the tongue strongly inclined to the right side. They were killed successively on the 3d June by pithing.

In the first dog the gustatory was firmly joined to the hypoglossal nerve by a fusiform cicatrix. The cranial end of the latter presented a slight grayish enlargement, from which a fine cord passed to the cicatrix. The gustatory was cut as high as possible, but there was no motion of the tongue, whether this nerve, or even the cicatrix between it and the hypoglossal, was pinched. The muscles however, still contracted when electricity was applied directly to their substance. They also contracted on the hypoglossal nerve on the same side being pinched.

In the second dog the cranial end of the hypoglossal was united to its peripheral end by a similar small filament. Pinching of the gustatory nerve made three minutes after death, and before it was cut, was immediately followed by active contractions of the lingual muscles. After its section, pinching of its distal portion produced no effect whatever on the tongue. On the contrary pinching of the cicatrix joining the two nerves, caused active contractions.

It follows that a sensitive nerve—the gustatory—though united to a motor nerve, still determines reflex actions by virtue of its sensitive function, while it is incapable of transmitting motor power to fibres which already exist in the cicatrix, and are patent to microscopical observation. Sensitive nervous fibres may thus be held incapable of undergoing transformation into motor fibres.

---

## THE CONVEYANCE OF DISEASED CATTLE.

(From the *Scottish Farmer and Horticulturist*, April 20, 1864.)

LAST Wednesday, a circumstance came under our notice which indicates how, with a little proper management, great disasters can be avoided. We were walking along George IV. Bridge early in the morning, and observed a butcher driving a cow affected with the lung-disease towards Lauriston. Two small droves of half fed cattle passed; just such animals as a farmer with plenty of food on hand would only be too glad to buy. The healthy stock travelled

faster than the sick cow ; but as she was overtaken by each lot there was a *reconnaissance*, a snuffing and smelling between the oxen and the cow, which must inevitably have resulted in the infection of the then apparently healthy herds. If this cow had to be conveyed from the dairy to some slaughter-house, why was she not carted ? Why is there not a deep van kept in readiness at the Slaughter-houses, which could be hired for a trifle, in order to transport disabled or diseased stock ? On the score of humanity, as well as economy, such a conveyance should be provided ; and, moreover, dairymen and butchers should certainly be prevented from driving diseased cattle about the streets so as to infect other stock.

Two other instances may serve to strengthen our case. We had occasion on Saturday last to visit Murrayfield. On returning to town, we found a farm-servant driving a bullock along the road slowly, patiently, and with difficulty, for the bullock was suffering severely from the lung-disease. The animal had, so far as we could learn, been driven from beyond Corstorphine, and found his way to the Edinburgh Slaughter-houses. If the bullock must be killed and eaten, why was it not killed on the farm, rather than add the risk of infecting farm stock on the road to that of perhaps disturbing the digestive organs of those who fed on him. To drive a diseased animal far is simply seriously to aggravate its condition and deteriorate the flesh still more. If, therefore, it is determined that such animals must and shall be eaten, why not adopt a better system for effecting this object than the absurd one in vogue.

Having on the same day to visit Granton, we drove by Comely Bank Toll, and about a hundred yards before reaching the toll was the stain of the previous night's slaughter by the road-side. We inquired, and learned from two reliable sources, that a diseased cow had passed up in a very feeble condition through the Crewe and Comely Bank tolls, and having reached where it had to leave its blood stains, it sank exhausted. A butcher's cart was speedily in attendance, the animal's throat was cut, and no doubt its flesh has already been in great part digested by Edinburgh citizens. We hold that such cases are worthy the attention of the Society for the Prevention of Cruelty to Animals. They are cases of wanton cruelty and of reckless tampering with animal life. No more certain means of disseminating disease can be devised than the one of driving diseased cattle about, and spilling their infected blood by the road-side. If the butchers were paid by farmers to spread disease they could not accomplish the object more effectually.

---

## PLEURO-PNEUMONIA IN BRITAIN AND IN THE COLONIES.

(From the *Scottish Farmer and Horticulturist*, April 20, 1864.)

WE have received the first number of a new periodical published in Melbourne, Victoria, on the 21st January. The title of the journal is ominous enough. It is nothing more nor less than the "*Pleuro-Pneumonia Gazette*." We are told that some cattle in the territory of South Australia have become infected with pleuro-pneumonia, and that contagion has been spread by means of carriers' teams. The "*South Australian Register*" reports that a bullock-driver was allowed to cross the border with a team of working bullocks that were obviously diseased. Cattle are dying fast near Rockhampton in Queensland, and the ever-spreading and fatal malady "is making sad havoc amongst the cattle in the neighbourhood of Mount Beckworth, Evansford, and Stony Creek." In the opening article of the "*Pleuro-Pneumonia Gazette*" we find the following remarks :—"The veterinary surgeons of England have, with few exceptions, been strangely obstinate with regard to this particular disease, at first denying its contagious character, and now almost to a man refusing to see that inocula-



tion is the only mode of staying its progress." Practical veterinarians in this country are now nearly unanimous in regarding the lung-disease as due to contagion. The dissentients are few, and belong to the class of persons who believe the atmosphere always teeming with a mixture of epidemic influences. As to inoculation, the responsibility of its non-adoption rests not a little on the shoulders of Professor Simonds, who reported against the operation about a dozen years back. Inoculation is extensively practised in London, and it is now being carried out by the Professors of the New Veterinary College in Glasgow, Edinburgh, Newcastle, and in the counties of Perth and Fife. To this subject we shall recur shortly, but we may in the meantime say that, if the farmers and others, instead of denying the existence of disease, would set to work in right earnest to get rid of it, they would not only benefit themselves, but the country at large. It were well if, like our Australian brethren, we would discover where the disease is raging, and put a stop to it. That this can be done is already demonstrated by experience.

---

### DISEASED MEAT.

*(From the Lancet, April 1864.)*

WE direct attention to the trial of John Thomas Teasdale, "a respectable-looking young man," a butcher at a place called Pinchbeck, near Spalding, in Lincolnshire, who was found guilty of a misdemeanour, for having sent to a salesman in Leadenhall Market a quantity of meat that was not fit for human food. The trial exhibited a state of things which the metropolitan authorities are determined to check. The beneficial results of the vigilance which has been exercised, and of the direction of public attention to the importance of the prevention of such foul practices, are now manifest. It was shown that the prisoner purchased a cow knowing her to be in an advanced stage of disease, that he had her slaughtered and dressed, and consigned her to a London salesman, Mr Lee, of Leadenhall Market, who, on the arrival of the carcase, immediately observed its condition, and communicated with Mr Wylde, one of the inspectors of the market, who seized and destroyed it. The jury found the prisoner guilty, but recommended him to mercy on account of his youth. Mr Sleigh, who prosecuted, informed the Court that, notwithstanding the numerous convictions for this offence that had taken place, there had been no less than two hundred thousand pounds weight of diseased meat seized in the markets belonging to the city of London during the last year. Mr Commissioner Kerr, before whom the case was tried, said the offence was a serious one. It was the poorer classes who were most likely to be sufferers by such proceedings; and under all the circumstances, while fully desirous to give effect to the recommendation of the jury, he felt it his duty to sentence him to be imprisoned for four months, and to pay a fine of L.50, and to be further imprisoned till that fine is paid.

This is the only way in which a stop can be put to this dangerous and disgraceful practice. Mr Commissioner Kerr well sustains his reputation as a discriminating judge, in not permitting the incomprehensible recommendation of the jury to prevent him from inflicting adequate punishment. It is a question of common interest, because one of public safety, that every effort be made to preserve the health of the poor, and prevent the crowded metropolis being the centre of infectious diseases, of which there is no more certain source than diseased food in conjunction with crowded dwellings. The name of Mr Lee, the meat salesman of Leadenhall Market, is deserving of honourable mention for the promptness he displayed in bringing to justice one who sought to traffic in food unfit for the maintenance of human life.

## THE CASTRATION OF LAMBS.

BY A PRACTICAL FARMER.

*(From the Mark Lane Express, April 14, 1864.)*

THIS is not a subject upon which much need be said, but at this season of the year, when breeders are ordering their breeding-flocks, it may be desirable to offer a few plain directions upon the practice of castrating and other treatment of lambs. Every lamb to be castrated should be in a strong and healthy state. Weakly lambs have always enough to do to live, without having to undergo the painful and somewhat precarious operation of castration. Neither should very young lambs be subjected to it. If the ewe has plenty of milk, and the lamb is doing pretty well, it will be ready for castration in about twelve or fourteen days after birth, and between that day and the twentieth day is proved by experience to be the best time for effecting the operation. Of course everything must be left to the judgment of the breeder and his shepherd, as to the precise state of every lamb as it is brought up for the operator. If it appears to be weak and sickly, by all means let it be passed, or at all events for the time; and if it should continue unthrifty, let it pass altogether till the autumn, or, indeed, till it has gained strength enough to undergo the pain without much danger. The same remark would apply to a lamb that has attained to a large growth, "too old for cutting." It is better that it wait till the autumn, or following spring, and then to undergo one of the operations to be described presently. The common practice generally adopted of castrating lambs indiscriminately, without reference to their precise condition, or preparedness to withstand the pain and fever, cannot be too strongly deprecated. It is as though a doctor prescribed alike for all patients coming under his care. There is a best time to operate, and a best time for the lamb to be in; and the shepherd must not, as far as his judgment can direct him, deviate from the nearest approach to it. It is no doubt so very easy and nice, and attended with much less trouble, when the flock is all brought into the sheep pens, to go through with the whole batch of lambs at once; but this is highly censurable and wrong. Shepherds must not mind the trouble. They must not, we repeat, castrate any lamb which they deem to be in an improper state to undergo it.

The usual manner of the operation is this: The operator's assistant places the back of the lamb upon, or rather in front, of his shoulder, with a fore-leg and hind-leg in each hand. In this position he holds it firmly, with the legs distended, so as to enable the operator to get at "the purse." The operator should then, with a knife that is wholly free from taint, cut off the front of the purse, having first ascertained that the testicles are all right, and in a proper state to be extracted. He should then cut the film or slight skin in front of each testicle, having hold of the purse with his finger and thumb, so as gently to press them forward, and then with his teeth, gradually and slowly draw them separately away. The purse should be slightly opened and examined, and that with the greatest care, so as to avoid giving pain. The flock-mark of the ear, and the shortening of the tail, should next be done, and the lamb put out of hand in the gentlest manner possible, and then all are to be left undisturbed for some hours. It is the height of folly to drive them any distance immediately after the operation. The whole proceeding should take place in the field where they are suckling. After a time, it may be desirable for the shepherd to cause them all to move, to see if any require his aid in any way. Some may be incapable of following the ewe. The shepherd must bring her to the lamb, and see that it is properly suckled. Occasionally the purse will collect blood and gangrenous matter. It must then be opened, and fomentations or emollient ointment used to cure it; of which course is preferable the shepherd can best judge at the time. If the lambs are in a proper state, and the weather is suitable, there is not much danger in the operation. Much depends upon the state of the weather. Heavy rains, frosts, cold bleak winds, or very changeable weather, is sure to be attended with



danger. A mild, sunny day should be chosen, so that the poor lamb may lie down immediately after the operation, without hazard of taking cold ; for, should it do so, fever is sure to fly to the affected part. It is very reprehensible to make use of stringent oils or any other like application to the purse immediately after castration. It is often done, but it is wrong.

I have advised that all weakly lambs, and lambs "too old for cutting," should be left till the autumn, or some more suitable time for depriving them of their testicles. This deprivation is easily effected, and with but slight damage to the lamb. Indeed, many breeders prefer leaving their whole flock till the spring, upon the plea that they winter better and grow larger—an idea in which there is much plausibility and some truth.

There are several popular ways of castrating older sheep—tying, trapping, burning, cutting. The operation of tying is probably the safest plan ; but as it is a long time before the sheep is freed of its purse, the tendency is to prevent its progress too long. Trapping is only another phase of the same operation. Burning is the quickest course, but is often attended with danger ; as is also cutting. The burning operation takes off the purse at once by a cauterising iron. Cutting is by the incision at the sides of the purse ; and by thus taking away the testicles, it leaves a larger cod, which is prized by graziers. Trapping is done by tying two short slats of wood very tightly upon either side of the purse, so as to impede all circulation. This eventually causes the purse to slough off. If properly done, this course is a safe one, but tedious in its result. The same may be said of tying, the difference being merely this : The one is tied tightly with cord and slats of wood, the other by strong cord. In both cases the operation takes effect through impeded circulation, but is a long time in effecting the desired end ; but both are tolerably safe processes.

In my own flock I generally resort to the old-fashioned practice of tying, if I have, as occasionally happens, sheep standing over that are not qualified for rams. I have practised burning to some extent, but not with a favourable result. Still less have I succeeded with trapping ; whilst others have succeeded exceedingly well. Cutting I have tried partially, but can give no good, or even fair, opinion upon its merits.

Much depends upon any of these courses being placed in the hands of a well-qualified, experienced, and expert practitioner : in the hands of inexperienced men, much loss is certain to take place. There is a good deal of tact, or a "good knack," required in successfully completing these apparently simple operations. But it is so in most of these common farm cases. Farmers are too much inclined to leave these cases to the shepherd or some like personage on the farm. It may be right in some cases ; but, for the most part, a regular practitioner should be sought for, and all cases should be committed to his care. This is by no means an unimportant question, considering the present price of sheep. The best aid in all such cases ought to be had, the expense is trifling.

---

### OBSERVATIONS ON STERILITY IN MAN: WITH CASES.

By T. B. CURLING, F.R.S., Surgeon to the London Hospital, and Examiner in Surgery to the University of London.

(From the *British and Foreign Medico-Chirurgical Review*, April 1864.)

STERILITY is a condition which has usually been restricted in its application to the female, or in the male has been confounded with impotency ; and until recently our knowledge of the impaired functions of the male reproductive organs has not warranted any distinction being drawn between an incapacity for sexual intercourse and an inability to procreate. The object of this paper is to show that a want of aptitude to impregnate may co-exist with the capacity for sexual intercourse ; or, in other words, that man is subject to *sterility*, independently of *impotency*. The subject is not altogether new, MM. Gosselin, Follin, Godard,

and others, having published some important facts in relation to it, but opportunities of making the necessary inquiries are extremely rare; and as doubt exists of the soundness of the conclusions which have been arrived at, facts of a contradictory character having been adduced, I have been led to examine the question, and my practice has enabled me to collect some interesting observations bearing upon it. The importance of the subject, as respects the happiness and results of married life, must be my apology for giving details, the recital of which could not be avoided.

Sterility in man may arise from the following causes:—

1. Malposition of the testicles. 2. Obstructions in the excretory ducts of the testicles. 3. Impediments to the escape of the seminal fluid.

1. *Sterility from Malposition of the Testicles.*—The opinion of John Hunter, “that when one or both testicles remain through life in the belly, they are exceedingly imperfect, and probably incapable of performing their natural functions,” has been the subject of much comment, and in my work on “Diseases of the Testis,” I expressed my adhesion to the views of Professor Owen, who, in differing from Mr Hunter, remarks that there is nothing in such a situation which necessarily tends to impair the efficiency of the testicles, since in many animals they constantly form part of the abdominal viscera; and in those in which the testes naturally pass into the scrotum, their continuance in the abdomen is accompanied only with a difference of size or shape. Now, we may readily suppose that this may influence the quantity, but not necessarily the quality of the secretion. The facts which I am about to adduce have corroborated Mr Hunter’s opinion in a remarkable manner, and have led me entirely to change my own views on the point in question.

That a cryptorchic person, or a man with both testicles in the abdomen or in the groin, may have a masculine development, passion for women, and the power to copulate, is beyond question, being satisfactorily established by several well-authenticated instances, although there have been many cases in which such persons were impotent, and had not fully exhibited the external characters of the male sex. When the testicle has not passed into the scrotum, the gland is nearly always small in size; generally it is healthy, but undeveloped; that is to say, it has not undergone the enlargement and change in structure which take place at puberty. In some instances, especially when seated in the inguinal canal, it is withered and atrophied, having undergone fibrous and more rarely fatty degeneration, and exhibiting no trace of glandular structure. But the question to be considered is, whether a testicle which has not passed into the scrotum can secrete a fertilizing fluid—a fluid which, when emitted in sexual intercourse, is capable of impregnating the female. I assume, as quite established, that to possess this property the semen must contain zoosperms.

Professor Goubaux, a distinguished French veterinary surgeon, was the first who noticed in horses, not only that the testicles detained in the abdomen were soft and small in size, but that the fluid in the corresponding vesiculæ seminales was destitute of spermatozoa. In 1851 M. Follin briefly alluded to three instances of detained testicle on one side in the human subject in which he found the fluid in the vesicula seminalis of the same side destitute of spermatozoa, though they were present on the other side.<sup>1</sup> In 1855 I described<sup>2</sup> the examination of a man aged thirty-six, whose right testicle was in the abdomen, small and undeveloped. There were no spermatozoa in the efferent ducts nor in the right vesicula seminalis, but the left contained them in abundance. In 1856 Messrs Goubaux and Follin, in a joint memoir, “*Sur la Cryptorchidie chez l’Homme et les principaux Animaux Domestiques*,” read at the Société de Biologie, adduced several instances in man and animals in which testicles remaining in the abdomen were small, and did not secrete sperm. They furnished also a few examples of animals which, though possessing the desire and power

<sup>1</sup> Archives Générales de Médecine, 4<sup>e</sup> Série, t. xxvi. p. 265.

<sup>2</sup> Diseases of Testis, 2d edit., p. 27.



to copulate, were quite sterile. The late M. Godard, in a memoir read at the Société de Biologie on the same evening as the above, mentioned the cases of three cryptorchic married men who had no children, and affirmed that such persons were always sterile. This earnest and indefatigable pathologist, whose recent death is a loss to medical science, in a more recent work, supported this opinion by additional facts, to which I shall have occasion to refer. The proofs adduced, however, by these observers, were not sufficiently cogent and numerous to establish the law that cryptorchics are infertile; and it could not be expected that assent should be given to results so remarkable and unexpected without evidence of the most convincing character. Opposite opinions continue to be entertained, and Dr Taylor, in the last edition (1861) of his work on Medical Jurisprudence, after briefly noticing some recent observations on this subject, states that when the power of sexual intercourse exists, "this imperfection does not offer any bar to marriage, nor is it a ground for divorce."

CASE I.—In 1859, a gentleman aged thirty-eight, consulted me under the following circumstances:—His testicles had never properly descended into the scrotum, and though not deficient in copulative powers, he had been married eleven years without his wife becoming pregnant. He was desirous of knowing whether this was owing to any fault in himself. In external development, this gentleman had all the attributes of the male sex. On examination, I found his penis normal, and his testicles small in size, the right being less than the left. Both were lodged in the groin, just outside the outer ring. The right could be easily pressed up into the inguinal canal, through rather a large external ring. Pressure on the left caused it to recede into the upper part of the thigh, just below Poupart's ligament, where the integuments were loose. When the left testicle became thus displaced, which occurred occasionally, the patient felt uneasiness, referred to the navel. The scrotum was small and imperfectly developed; the left testicle could be depressed into it by a little force. He stated that he performed the sexual functions about twice weekly, and when younger had done so more frequently. The fluid emitted in intercourse was carefully examined by myself and Dr Andrew Clark separately, on three occasions, at intervals of about a week. It was found to be entirely destitute of spermatozoa. With the view of forcing the left testicle into the scrotum, and retaining it there, I recommended his wearing the moc-main lever truss, but this treatment was not persevered in.

CASE II.—In 1852 I was requested to see an inmate of a charitable asylum, a youth, aged eleven, whose testicles had not passed into the scrotum. The right was lodged just outside the external ring; the left was not discernible at all. He had no scrotum. In 1861, at the age of twenty-one, he again came under my notice. He was rather short in stature, but had a masculine development. He wore a moustache, and had abundance of hair on the pubes. His penis was rather large. He held a clerk's situation in the city, and had been married twelve months. He stated that he had frequent intercourse with his wife, followed by ejaculations. She had not become pregnant. Some fluid obtained from the urethra immediately after sexual intercourse was sent me on two occasions, the second being after an interval of eighteen months. It was carefully examined by myself and others, and found to be destitute of spermatozoa.

CASE III.—In April 1861, I saw with Mr Duchesne, of Woodford, a gentleman, aged forty-six, a married man, who had serious disease of the left testicle, which had commenced about a month previously. The gland, being quite disorganised, was removed by me on the 22d. The wound healed favourably. During my attendance I noticed that the right testicle had not emerged from the abdomen. After his recovery, and quite two months after the operation, he had intercourse with his wife. The fluid emitted was examined, but no spermatozoa could be discovered in it.

CASE IV.—In March 1863, I was consulted on the propriety of marriage under the following circumstances:—A gentleman, thirty-nine years of age,



stated that about fourteen years ago he was in the habit of frequent sexual intercourse, when one night after connection the left testicle was attacked with violent inflammation, which was followed by a gradual wasting of the gland. The right testicle was small, and had not fairly passed into the scrotum. The sexual appetite was keen, and coition was effected with ease, the emission being fairly copious. My patient was healthily and moderately robust. The left testicle was reduced to the size of a pea; the right was properly formed and tolerably firm, but quite small, like an undeveloped testicle before puberty. Some fluid emitted in sexual intercourse was sent me on two occasions. In both instances it was thin and destitute of spermatozoa. I consequently gave an opinion adverse to his marrying, on the ground that he was unfit to procreate—that his wife would be barren.

In Table I. page 318, I have added to these four cases five others, well authenticated, in which the fluid ejaculated by men with retained testicles was submitted to examination and found to be wanting in spermatozoa.

In confirmation of the results obtained in these cases, I may adduce some interesting observations made upon the lower animals. The following are related in Messrs Goubaux and Follin's "Memoir." A horse, twelve years of age, though presenting all the characters of an entire horse, bore the well-known marks of castration on the right side, but on the left side there was no trace of cicatrix, and no scrotal sac or testicle. Erections were manifested in the vicinity of mares. After covering one, the fluid emitted from the urethra was examined, and found to be destitute of spermatozoa.—After the purchase of a horse six years old, a question arose between the buyer and vendor whether the animal could be used as a stallion. The veterinary surgeon could discover no testicles, although the skin of the region presented no marks of the animal having been castrated. In presence of a mare the horse manifested undoubted signs of the influence of the approach. He was allowed to cover her, but accomplished the act with more difficulty, and especially slowness, than usual with a vigorous stallion of the age. The examination of the fluid emitted on three occasions, at intervals of several days, afforded no trace of spermatozoa<sup>1</sup>. M. Godard relates<sup>2</sup> that a cryptorchic dog covered a bitch in heat four different times in March 1856. The fluid ejaculated on each occasion was found destitute of spermatozoa. In February 1857 the same dog, who was addicted to coition, again covered the bitch, and the sperm emitted was also found to contain no zoosperms.

I have already alluded to a few instances in which the fluid found after death in the substance of the retained testicle, in the epididymis or vas deferens, or in the vesicula seminalis on the side corresponding to the misplaced gland, has been examined and found destitute of spermatozoa. Many other examinations have been made. They are collected in Table II. page 319, which includes three observations of my own. Spermatozoa have not been discovered after death in the spermatic ways of a detained testicle in any one instance that I know of.

Gosselin and Godard make mention of several instances of cryptorchics who were married but had no children; and I know of another instance in addition to those related in this paper. Though it is most probable that in all these cases barrenness was owing to the absence of a fecundating property in the semen, yet, as it was not examined microscopically, no scientific value can be attached to these observations. It would be objected that the cause of sterility might *possibly* have been in the female.

The facts which have been adduced, as opposed to the conclusion that cryptorchics are sterile, are chiefly instances in which they are reputed to have pro-

<sup>1</sup> Professor Spooner, of the Veterinary College, informs me that he has examined several testes taken from the abdomen of horses after death, and in all of them the gland was small in size, and without spermatozoa.

<sup>2</sup> *Ibid.* p. 147.



TABLE I.

No.	Age.	Position of Testicles.	Sexual Condition.	State of Ejaculated Semen.	Authority.
1	38	.. Both in the groin, outside the abdominal rings.	.. Married eleven years; copulative powers satisfactory; no children.	.. Destitute of spermatozoa; examined three times.	.. Mr Curling.
2	21	.. Right, outside abdominal ring; left, within the abdomen.	.. Married two years; powers satisfactory; wife had not become pregnant.	.. Destitute of spermatozoa; examined twice at an interval of eighteen months.	.. Mr Curling.
3	46	.. Right, in the abdomen; left, removed by operation.	.. Married; powers satisfactory; no child.	.. Destitute of spermatozoa; examined once.	.. Mr Curling.
4	39	.. Right, outside inguinal canal; left, completely atrophied.	.. Single; powers satisfactory.	.. Destitute of spermatozoa; examined twice.	.. Mr Curling.
5	44	.. Left, outside inguinal canal; right, in the scrotum, but epididymis obstructed after orchitis.	.. Married; competent, but weak.	.. Destitute of spermatozoa; examined once.	.. Godard : Études sur la Monorchidie et la Cryptorchidie, p. 103.
6	22	.. One in iliac fossa; the other in inguinal canal.	.. Single. . . . .	.. Destitute of spermatozoa; examined several times.	.. Godard : Ibid., p. 147.
7	24	.. Both in the abdomen.	.. Single; had contracted gonorrhoea.	.. Destitute of spermatozoa; examined three times.	.. Godard : Ibid.
8	Not stated.	.. Both in the inguinal canal.	.. Married; powers satisfactory.	.. Destitute of spermatozoa; examined several times.	.. Puech : Gazette Hebdom., Dec. 1856.
9	24	.. Both in the abdomen.	.. Single; had desires, erections, and emissions.	.. Destitute of spermatozoa; examined four times.	.. Partridge : Path. Trans., vol. ii.

TABLE II.

No.	Age.	Cause of Death.	Position of the Testicles.	Condition of Malposed Testicle.	State of Seminal Fluid.	Authority.
1	36	.. Recent injury.	.. Right, within the abdomen; left, in the scrotum.	.. Healthy, but undeveloped; weight, 110 grs.	.. No spermatozoa in right vesicula seminalis, and ducts of right testicle.	.. Curling; Diseases of Testis, 2nd edition.
2	27	.. Intestinal obstruction.	.. Left, outside abdominal ring; right, in the scrotum.	.. Small and undeveloped.	.. Spermatozoa in left vesicula seminalis; no spermatozoa in left vas deferens and vesicula.	.. Curling; Patholog. Trans., vol. ix.
3	25	.. Disease of the heart.	.. Right, in the inguinal canal; left, in the scrotum.	.. Healthy, but small; weight, 132 grains.	.. Spermatozoa in right vesicula seminalis; no spermatozoa in right vas deferens and vesicula; spermatozoa in abundance in left vas deferens and vesicula.	.. Curling: Patholog. Trans., vol. xii.
4	24	.. Recent injury.	.. Right, within the abdomen; left, in the scrotum.	.. Healthy, but small.	.. No spermatozoa in right testicle, epididymis, vas deferens, and vesicula seminalis; spermatozoa in left epididymis, vas deferens, and vesicula.	.. Godard: Études sur la Monorchidie et Cryptorchidie, p. 54.
5	26	.. Meningitis.	.. Right, in the inguinal canal; left, in the scrotum.	.. Healthy, but small.	.. No spermatozoa in right vesicula seminalis; spermatozoa in left vesicula.	.. Godard: Ibid. p. 61.
6	50	.. Strangulated hernia.	.. Both outside abdominal rings.	.. Healthy.	.. No spermatozoa in the testicles, vasa deferentia, and vesiculæ.	.. Godard: Ibid. p. 124.
7	30	.. Peritonitis.	.. Both in inguinal canals.	.. Healthy.	.. No spermatozoa in the testicles, vasa deferentia, and vesiculæ.	.. Godard: Ibid. p. 127.
8	42	.. Strangulated hernia.	.. Both in inguinal canals.	.. Healthy.	.. No spermatozoa in the testicles.	.. Debrou: Jour. Hebd. de Médecine et de Chir., tome viii. p. 3.



created children. Mr Poland relates that a man, aged twenty-nine, once in the Dragoons, was admitted into Guy's Hospital on account of an omental hernia. His testicles had not descended, and there was no scrotum. The penis was well developed, and he had all the other signs of virility. He married when he was twenty, had two children by his first wife, and had been married two years to a second wife.<sup>1</sup> Mr Cock has mentioned to me the case of a man whose testicles had not descended, and in whom the virile functions were perfect. He had married twice, and had children by each wife. He was a man of dissipated habits, and had served in a public-house. Mr Durham has communicated to me the particulars of the case of a man with double oblique inguinal hernia, and with both testicles lodged in the inguinal canals. He was a well-grown, healthy labourer, aged thirty-two, and was operated on by Mr Durham, in Guy's Hospital, in consequence of strangulation of the hernia on the left side. The patient recovered favourably. The left testicle was exposed and handled during the operation. It was smaller than usual. He had a masculine development,<sup>2</sup> was married, and his wife had borne him two children. He stated that since puberty he had experienced strong sexual desires, and had always been competent. No opportunity was afforded for the examination of his seminal fluid, and the man scouted the idea of his testicles being inefficient.

(To be continued.)

---

## THE BLOOD-CORPUSCLES OF MAN AND BEASTS.

(From the *British and Foreign Medico-Chirurgical Review*, April 1864.)

DR H. WELCKER, of Halle, has a long paper on their size, number, volume, surface, and colour. As to their *size*, he says that "relying upon Harting's statements, *Cryptobranchus* is generally supposed to be the animal which has the largest blood-corpuscles. The author, in thirty measurements, found them on the average larger than did Harting in ten measurements (in which he agrees with the results of the old measurements of Van der Hoeven), but yet, for the *Proteus*, his measurements gave far more considerable dimensions: so that, he says, undoubtedly the latter animal has larger blood-corpuscles than the *Cryptobranchus*. He says their larger size may be seen at once with the microscope, without taking their comparative measurements. The author's averages were for the *Cryptobranchus japonicus* 0.051 mm. in length by 0.032 mm. in breadth, and for the *Proteus anguineus* 0.058 mm. in length by 0.036 mm. in breadth, of the dried corpuscles."

---

## OBITUARY.

MR PHILIP HEMPSON, May Fair, London. He obtained his Diploma May 24, 1855.

---

<sup>1</sup> Guy's Hospital Reports, Second Series, vol. i. p. 162.

<sup>2</sup> I visited the man at Guy's Hospital, and can bear testimony to his manly appearance.

# EDINBURGH VETERINARY REVIEW

AND

## Annals of Comparative Pathology.

---

### ORIGINAL COMMUNICATIONS AND CASES.

---

*On the Diseases to which the Feet of Horses are Subject.* By  
Professor GAMGEE, Senior.

#### CONTRACTION OF THE FOOT.

THIS is more of an imaginary than a real state. As we said, when treating on healthy structures and action, there is no alternate expansion and contraction going on in the foot, as has been supposed, during ordinary progression ; neither is there any antagonism kept up by the hoof, tending to constrict the vascular structures, and these, in turn, resisting that tendency.

Complete harmony of parts and counterparts, both in their form and action, subsists between the hoof and all it encircles, the same as between the outer tunic and subjacent structures of every animal in all its parts ; to be plain, the question is reduced to this,—when a horse's foot, which was once of normal proportion, has become unnaturally small and deformed, how has the change come about if not by contraction ? why, by wasting. Like as a man, or any animal who was once fully developed in every part, and when change is brought about by causes, whether from starvation, old age, or otherwise deranged health, wasting ensues, and the skin falls in proportionately. Yet, though the general condition of the horse be low, privations, and even old age, exert little appreciable change on the form of the foot of the animal, compared to the more common causes which prevail. It is inconsistent with rational theory, as it certainly is with fact, to entertain the commonly prevailing belief that a clear atmosphere, with the benign influence of the sun's rays, has a tendency to dry up, sear, or otherwise act injuriously on the hoof, which is a living structure, and is supplied from the blood with an abundant secretion for nourishment, suited to its economy. To suppose that a living part should be dried up like as happens with a common board, as has been said (see essay by Professor



La Fosse, of Toulouse), is, I submit, giving way to very unphilosophical ideas.

It is my belief that incalculable harm has been done to our horses, through the groundless notions entertained about contraction of the foot, and again, through imaginary causes inducing that supposed state.

The very strange hypothesis has brought about evil consequences in two ways,—*Firstly*, By treating horses and their feet in a way the reverse of correct; *Secondly*, By being put off their guard, men have neither appreciated, nor sought to learn that which is indispensable to the successful management of the animal.

The common agents in the deteriorating process, are excessive moisture to the foot, unduly diminishing the substance of the hoof, and shoes applied without system; and since there is but one right, and an infinity of wrong ways of performing the operation of shoeing, there are many chances to one against this latter part ever being done as required.

Whatever be the relative merits of shoers, the process will be greatly influenced by the general state in which the horse's feet are kept: if firm in texture, and under healthy influences, the power to resist unwelcome pressure will be the greater; when, however, various bad influences are combined, the evil results follow soon and more certainly.

#### FLAT OR CONVEXED SOLES.

A very similar series of causes, which give rise to the before-described condition, tend also to produce a flattened state of the foot. Breeding, form, action, and weight of the animal, influence the different changes, with the sustaining capabilities of the hoof; and its inherent conservant property of maintaining the symmetrical figure is dependent on the same hygienic conditions as are required for its first development. All weakening measures tend to alter the physical state of the sole; softening, paring, and rasping the hoof, want of knowledge or care in shoeing, and insufficient exercise, all induce debility, and constitute causes detrimental to the whole foot, and by whatever process the sole of the hoof is debilitated, the wall is rendered inefficient for its functions, and either bulges downwards, or collapse and increase of convexity upwards ensues, accordingly as concomitant influences prevail. Every one who has walked with a soleless shoe, or with the sole soaked by standing in wet until it became as soft as a sponge; knows that the upper-leather in such cases becomes useless as a means of support to the foot. In the case of the horse under influences supposed, the pedal bone and all the plantar structures become flattened, as does the hoof, in conformity and by virtue of natural laws; the most pronounced margins of the



coffin-bone become removed by absorption, whilst the energy of locomotive force is proportionately diminished. Having dwelt on the causes, their avoidance will constitute the means of prevention, and an opposite course to such as has been referred to will become the best remedy. A right system of shoeing will be found the best of conservative means, as well as the most effective of curative agents.



*Thrush.*—This is a diseased condition of the villous membrane covering the fibrous frog; the cleft is the part commonly first affected, and, when neglected, the disease spreads over the whole of that organ to its point and backwards, the horn becoming detached from the bulbs of the heels, and to some extent round the coronet towards the quarters. The immediate seat of the disease is the vascular surface of the frog: it is a sub-cuticular affection, and never insinuates beneath the true hoof.

There is no other disease so commonly prevalent in the foot as thrush, about which there is so much diversity of opinion amongst veterinarians as to the cause; and true it is, whichever view we take there is always an opposite one,—to be entertained and defended almost as strongly,—in the belief of any one who has made up his mind differently. Light-formed horses, and even the best bred amongst them, are, under similar conditions, the most commonly



affected with thrushes, and the hind feet are the most liable. Contraction of the hoof has been regarded as the main cause of thrushes; it has been thought that the frog becomes compressed by the narrowing of the hoof. Without further reference to such views, and our grounds of dissent from them, we have only to observe, that this disease is very prevalent amongst horses which are running loose unshod, and also amongst those where no shoes have ever been applied.

A wet and filthy farm-yard furnishes all the noxious agencies in the greatest abundance, which give rise to thrushes, and a general weak state of the foot. Only reverse these conditions, and keep horses on a firm, well-drained soil, and their hoofs will become almost uniformly excellent physically, as well as firm, elastic, and strong in texture; the arched form of the pedal bone and the perfection of every fibre in the foot will then become such as to adapt the animal for any work.

Another and common cause of thrush, as it prevails amongst working horses, is justly attributed to impairment of the functions of the foot, through the shoe—when, for instance, the foot, through excess of shortening of the toe, and leaving the heels high, is rendered unduly upright, in which cases there is a considerable derangement to functions; one of the common effects is the appearance of thrush.

*Treatment.*—Remove loose parts of horn from the frog, and put the whole hoof as far as admissible into its normal state, let the horse be shod according to rule, and his stable be dry and clean. The feet should be washed morning and evening in clean water, and the heels wiped dry at once; and every fourth or fifth day, when the hoofs are dry, a pledget of tow, charged with Barbadoes tar, may be introduced into the cleft of the frog, and pressed into the commissures around it. If the horse is not required for work, as in the case of young stock, brood mares, &c., let the shoeing be omitted, and all the other things prescribed attended to.

Thrush is, as we have shown, an effect of bad management; and, in its turn, becomes a cause of further derangement in the foot, and therefore no one should consider his horse in a safe and salutary condition with such an offensive state of the frogs as thrushes present; nor is a horse in the possession of his full power in such a state of ulceration of that organ, wasting being the usual concomitant of diseased frog, hence loss of much of the natural elasticity of the foot. In most cases, when all the conditions of the foot have been attended to, healthy action succeeds; in others, as when horses have been bred in uncongenial ground, it takes a long time to induce the normal functions, and especially before the tone of the secreting surfaces can be brought about.

## CANKER.

Canker of the foot of the horse is a diseased state of a peculiar character, in which, primarily, the same local structures are affected as in the case of thrush; and it has, by some, been described as another stage, or one arising out of a neglected and inveterate state of that disease. It is, however, quite distinct, rapidly extending from the frog to the sole, and even the laminated structures become involved in the offensive and rapidly-destructive ulceration.

The characteristic symptoms of this disease are so strongly marked, that they can never be mistaken by any one who has seen a case before. Distinguishable from an ordinary thrush, by the frog being large, flattened, and spongy to the feel and appearance, by its giving off a secretion of most offensively-smelling limpid matter; resembling in kind and copiousness that which is seen in the worst cases of grease; to which, in all respects, canker of the foot bears a strong resemblance; so that the two may be called twin diseases, often co-existing, and always common to the same class of low-bred, poor-conditioned horses, such as are ill-cared for, with their feet exposed to wet and filth. Without going so far as to say that any class of horse, under good management, is exempt from this disease, I can most decidedly state that I have never met with a case of canker amongst race-horses, hunters, or in any gentleman's establishment where ordinary grooming is enforced. It is a fact, too, that well-bred horses—whatever their class, if of good stamina—are seldom the victims of the diseases, canker and grease, even where common causes are not altogether excluded.

The treatment for canker consists, in the first place, of removal of all detaching horn from the affected parts, care being taken not to cut deep, so as to cause effusion of blood, which, with the non-experienced operator, will be liable to happen, through the deceptive appearances of the sprouting fungous surface, which assumes a horny character whilst it is endowed with considerable vascularity.

Astringent remedies and mild caustics form the proper dressings. We have found nitric acid and tar answer best of all, taking about four ounces of the former, placing it in an iron ladle, and adding one drachm of the acid, stirring the mixture briskly with a wooden spatula when heat is evolved, and the preparation is to be spread quickly over the exposed surface, the part being previously cleansed and dried. The surface should then be covered with dry tow and bound up; or, in cases where the disease is confined to the frog and part of the sole, a shoe may be tacked on, by which means the dressing can be the better retained, by splinters of wood being placed over the tow.

Different practitioners have their favourite and special dress-



ings for the cure of canker; and good results are attributed to the use of a variety of agents, whilst failure not unfrequently attends all our best efforts and means; in such cases, for instance, as when two feet are very badly affected, or, as we have seen, when all four feet of the horse are equally diseased at the same time, and when it has been impossible to induce him to stand upon the opposite or parallel foot, whilst the one is lifted for the necessary time to be dressed. Nor can casting the horse, for the purpose of dressing the feet, often be made effectual, since the process requires to be repeated every other day, and, at best, will take a long time to produce any permanently good result. Moreover, we believe that there is a constitutional taint in those cases, and experience has taught us that few horses in such condition are likely to pay the cost of their treatment.

#### CORN.

This is another of the diseases of the connecting structures of the foot in which the hoof participates in the effects.

The prevailing accepted definition of corn is an erroneous one—viz., that of its being a bruise between the posterior extremity of the coffin-bone above and the hoof below, by which extravasation of blood is said to ensue. It is nothing of the kind, though bruising of the sole does happen in cases of flat-footed horses, while their feet are made still flatter by shoeing and bad management; and in such cases it is possible for the sole to bear on the shoe, fix it at different parts, and produce injury to the bone and intervening tissues, when pain and rapidly-changing complications follow. In the case assumed, however, we have not the production of that which has received the name of corn; which in the foot of an ordinary-sized horse takes place an inch behind the extremity of the coffin-bone. Corns occur to horses with the best of feet, the common cause being the worst of shoeing. The seat of corn is in the laminated structures at the angles of inflection, or, as may be better understood, the extreme point of the heel. They happen in a similar way, under fast exertion, as that of a blister on our heel under hard marches. The ecchymosis which follows the injury, and which is called the corn, is nothing else than an after effect, due to gravitation of the blood-stained serum which is exuded. The corn is a reality, as its name implies; it consists in a horn tumour, at the angle above indicated. These tumefactions reach to various proportions, from that of enlargement and increased density of the common horn laminae, to their obliteration, and in their place, an intruding growth of smooth horn, more dense than that of any part of the hoof normally is formed.

The writer first published a description of these horn tumours in 1859-60, when some specimens were presented to the Museum of the Royal College of Veterinary Surgeons of London. The discovery led to further observation, and a more accurate under-

standing of the whole subject by the author than had up to that time been arrived at.

This effort of nature to fence out and strengthen, as man mutilates and weakens, offers a warning lesson to those who cut and destroy the sole of the hoof: we find that the more that structure is scooped away, and the external cavity deepened, so relatively does the intrusion increase upwards, the tissues and cartilage making way by their becoming absorbed.

These baneful conditions protracted, lead on to further complications, which indeed, are always progressing simultaneously when injury is in force. The most common form by which the succeeding crisis manifests itself is by suppuration.

This last state seldom arises until after the horse has endured long suffering from corns; it is not usually until the internal horn tumours are formed that sloughing of parts and quittor is brought on. And this is important to be understood, because a prevailing vicious practice is kept in vogue, of cutting away the sole of every lame horse in search for matter, under the pretence of exploring, and, as is supposed, to give vent to its pent-up state. Blood only, in the case is found, and with that the searcher is satisfied; whilst mischief is done, such as takes months to repair, even should the patient get under better care. The proper treatment for corns is a rightly-applied system of shoeing—for which, consult directions on that subject.

#### SAND-CRACK.

A sand-crack consists of a fissure of more or less extent in length, which always begins at the coronet, in the quarter of the foot, over the cartilage. The crack, usually insignificant in appearance at first, is located in the upper thin margin of the wall; the cuticular band giving way, the wall opens in the direction of its fibres downwards. Union never takes place again, but every hour after the lesion is formed, confirms and augments the state of the disorder until remedied; inflammation of the skin is set up, the part becomes painful, and the lips of the wound gape as the tissues swell. The inner quarter is the most common seat of sand-crack, though it happens to both sides of the same foot in some instances. This ordinary character of sand-crack happens only to the fore feet.

The causes of sand-crack are more varied than those which produce the last disease considered—corn, the strong and good feet often becoming the seat of that lesion and its attendant complications.

In this respect only the causes of these lesions are common, in so far that sand-crack, like corns, requires the baneful influence of bad shoeing for its production, with this difference, however, that a predisposition almost always prevails with horses in whose feet sand-cracks appear; they occur in horses with weak feet, such



as have been bred where hard or firm sound soil, and liberty to range over it, has been wanting. English horses generally are, of all domesticated breeds, the least subject to sand-crack of any that we know of, either European or Oriental; and this observation holds good, though our horses be taken to distant countries at an early age: the immunity follows on a perfect development of the foot with the growth of the horse.

Some notion may be formed of the acute pain which the smallest bursting of the cuticle and hoof at the coronet gives, by those who have been exposed to causes giving rise to cracks at the base of the nail; which, however, it should be remarked, is insignificant, with our hands moving freely, compared to the state of the horse, under the forced exertion of his feet on the ground. A small sand-crack soon acquires larger dimensions, contiguous parts take on inflammation, and swell; the wound gapes, and though no additional splitting of the hoof occurs, the length of the fissure seems to be augmenting, and is actually increased daily by the growth of the hoof, with no possibility of reunion. Unrelieved, the case becomes worse, blood issues under exertion, and, as the wound advances, with some partially effective attempts to relieve it; nature, always provident in fencing out extraneous matter, forms a secretion of horn at the sides and bottom of the crack, giving rise to an inner ridge, or, as the French call it, a seam, to get rid of which they remove the wall at the quarter, which is a formidable, tedious, and we believe uncalled-for procedure.

The treatment we adopt consists in placing the part at rest, in some cases this calls for giving rest to the horse for a period of from thirty to fifty days. The most common custom, and one long adopted, is to apply a bar shoe, by which means it is sought to prevent bearing from being imposed on the injured quarter of the foot, which is partially effected by the frog reposing on the shoe, and relieving the quarter of some of the burden. The above is, however, at best, only a palliation, and not an effectual remedy, admissible only with horses used for moderately slow work—for draught.

Of late years, with a better devised system of shoeing, we have been able to give effectual relief by application to that part of our art, with little or no deviation from our ordinary method or any additional complexity; the feet are, as in other cases, attended to with reference to their general salutary state, and no case has occurred in the meantime where sand-crack has given us any trouble, or which has not healed and the hoof grown down completely sound, commencing from the time we have adopted the proper means.

Giving the horse complete rest, without shoes, when practicable, affords the most simple means of curing him of sand-crack, nothing further being required than to follow our directions so frequently given in this Review on the general management of horses' feet.

nothing else being required than treating the feet, as in most cases of lameness we advise. Placing the horse in a loose box so that he may get free exercise, forms an additional requisite measure for the restoration, and is compatible with the prescribed rest. No binding up of the foot avails any good, and all cutting and exploration should be avoided, especially the practice of firing, which only becomes a source of pain and protracted or permanent injury.

False quarter, considered along with sand-crack, may be regarded as an attempted distinction without a difference. A little confusion of terms is in the case brought into play. In some countries, in Italy for instance, of which the literature on the subject is older than our own, all ordinary sand-cracks are described as *quarti-falsi*, which implies a condition such as the wall exhibits when a gaping fissure from the coronet to the bottom is present, and that part of the hoof posteriorly, is loose—false, and wants connection in function as well as substance with the front of the foot; and when, from continued or otherwise sustained injury, the secreting structures of the coronet are much destroyed, the absolute breach or great weakness becomes permanent,—hence a permanent sand-crack or false quarter.

---

*Condylomata in the Dog.* By JAMES LAW, New Veterinary College.

THIS is perhaps a more common affection than is generally supposed, or than might be expected, from the absence of cases recorded in British Veterinary literature. Two cases have been recently met with in the clinique of the New Veterinary College—one during the summer of 1863, and the other in the course of March 1864. The subject in either case was a bull-terrier, and the situation of the growth, in both alike, was the mucous membrane covering the bulb of the penis. Both dogs had been employed as stallions, so that the causes were identical. The symptoms in the two cases were alike, consisting of frequent licking of the prepuce, inability to protrude the penis in attempting to line a bitch, a discharge from the prepuce of a muco-purulent liquid frequently mixed with blood, and a marked swelling of the sheath towards the root of the penis, and found by manipulation to be unconnected with the skin in this region. The history of the cases revealed that both dogs had been for some time treated, unsuccessfully, for gonorrhœa.

The tumours were removed by Professor John Gamgee,—in one case under the influence of chloroform. The penis was forcibly protruded from the sheath—a matter of some little difficulty—when the morbid growth was exposed attached to the bulb, and



completely encircling it. It consisted of a series of lobules of varying sizes, intimately connected to each other at their bases, but having free projecting apices. They had a bright red hue, and were partially coated with a muco-purulent fluid which filled up the intervals between the lobules. The tumour had a very soft and friable appearance. The excision was effected with the scissors, care being taken to remove the whole of the morbid growth, leaving only the corium of the mucous membrane from which it had grown. The hæmorrhage was slight, and readily ceased when the parts were washed with tincture of the sesquichloride of iron. Neither of the cases required any after treatment, except such as was necessary to keep the parts clean, nor, so far as we can learn, is there any appearance of the growths being reproduced.

The tumour from the dog last operated on weighs two drachms. At the part corresponding to the bases of the lobules is a thin membrane to which these become attached. Examined microscopically, by placing a small portion of one lobule under the field of view, it appears to be composed almost exclusively of nucleated epithelium cells, with a small proportion of fibres intermixed. On placing under the microscope a thin slice from a lobule previously hardened in spirit, there appears fibrous prolongations passing in slightly diverging courses and covered by numerous layers of epithelial cells. These are evidently the hypertrophied papillæ of the mucous membrane, with an enormous production of epithelium.

This malady, like warts on the horse's penis, seems dependent on simple inflammation of the parts, set up by injury of the mucous membrane. The fact that both dogs were used as stallions points to the source of injury in both cases above mentioned. By repeated coitus compulsorily prolonged, by virtue of the anatomical arrangement of parts, and it may be, also, by reason of the disproportionate size of the male over the female, and especially if they are subjected to annoyance, both animals are liable to be injured. On the part of the male the bulbous enlargement which is imprisoned in the vagina is most exposed, and here accordingly we find the tumour developed.

---

*The Foot-and-Mouth Disease in Man, and the Sale of Diseased Animals.* Being a Report by Mr JAMES HIGGINS, Meat Inspector at Leeds.

I RECENTLY sent you a copy of the "Leeds Mercury," in which appeared a leading article upon the subject of diseased meat and milk. As I was the authority upon which certain statements were made, the editors of that paper have sent me your letter addressed to them, with a request that I would give you the re-

quired information upon the matter of the milk of cows suffering from the foot-and-mouth disease, and its effects upon the human subject.

The statement in the "Mercury" is,—“ We are assured, on indisputable authority, that cows known to be labouring under that disgusting malady, popularly known as the ‘Foot-and-Mouth Disease,’ are frequently milked by the farmer and milk-dealer, and their milk sent into the markets mixed with other milk for ordinary consumption, and that many cases are known in which eruptions about the mouth have broken out in consequence of drinking this milk.” Upon the first part of this statement I may say that farmers and cow-keepers in this borough and neighbourhood make no scruple about the fact. I have been told over and over again that it is their practice to sell such milk, and been assured that it would do *no* harm. I have received this information from owners of stock, and their servants. With regard to the latter and more important statement, as to disease being caused by the use of such milk, I will state such facts as have come under my own observation as Inspector of Meat in this borough.

In the summer of 1862, I received information that a number of persons, adults and young children, residing in Bramley Kirkstale, within this borough, were affected with a disease similar to the foot-and-mouth disease in cattle, and that one whole family of five persons were suffering from that complaint. I considered it my duty to report the matter to my committee, and an investigation took place to ascertain the cause. It was found that in Bramley a cowkeeper had the epidemic, or foot-and-mouth disease, among his cattle, and that the complaint referred to was among the families of the persons who took his milk. A quantity of the milk was procured, and sent to Dr Bishop of Headingley, an active member of the Town Council, and a member of the Nuisance Committee. I have this day called upon the doctor and left with him your letter, and he will report to you the state of the milk, and such observations as are the result of his inquiry. In addition, I may state that the person who first called my attention to this matter was a butcher of Bramley, at whose house the diseased milk was delivered, and whose family suffered from the effects. This butcher is an intelligent man, and is well acquainted with such matters as diseased cattle. He will write you the particulars of this case. I have also had diseased milk delivered at my house on two separate occasions by my milkman. The milk was similar in appearance to the milk examined by Dr Bishop. Of course I threw it away. On inquiry of my milkman as to where he got his milk from, he told me of the dairyman mentioned. I knew that the cows were suffering from the disease. Some of them had been sent to slaughter, under my inspection, only a fortnight before. A butcher, a friend of mine, told me that



his child, a little girl two years old, was suffering from eruptions about the mouth, and blistered tongue, in a similar manner as cattle affected by foot-and-mouth disease. On inquiring where he got his milk, I found that he had been in the habit of taking milk from cows brought to the slaughter-houses, and that his child had consumed such milk in a raw state. I think it more than probable that he may have taken milk from a diseased animal. I have seen many cases of persons who have had eruptions about the mouth, and it is a great pity that the medical profession have not made investigations as to the cause of such complaints.

In a former communication which I sent you, I gave you some particulars as to the extent of disease among cattle in this neighbourhood, and stated the number of cattle sent to slaughter in the slaughter-houses in this town which were affected with pleuro-pneumonia. I am enabled to furnish you with a complete return of the number of diseased cattle and carcasses brought into this borough during the year ending 31st December 1863, and which were submitted to me for examination previous to their being exposed or offered for sale ; the numbers and the results of such examination are as follows :—

Beasts, 737 Examined ; 543 Passed ; 194 Condemned as unfit for food.						
Calves, 150	„	...	„	150	„	„
Sheep, 353	„	149	„	204	„	„
Pigs, 138	„	88	„	50	„	„
<hr/>		<hr/>		<hr/>		
1378		780		598		

You will find by the above that during last year no less than 598 diseased carcasses were condemned as unfit for human food. Of the 737 beasts examined, no less than 467 were affected with pleuro-pneumonia ; they belonged to farmers and cow-keepers in the borough and the grazing districts of the neighbourhood. One person at Tadcaster, sent to this town to slaughter upwards of 60 head of cattle affected with that disease. Another sent more than 40 ; a third 28. In November last, a gentleman had 25 fine milch cows, worth on an average L.21 each. Pleuro-pneumonia appeared among his cattle, and before Christmas-day he had lost 21 out of the 25. Mr Lister has kept cows for thirty years, and never had pleuro-pneumonia before. He unfortunately, at the back end, took some rough grass to eat in a field on the Leeds and Harrowgate road, and I think that his cattle may have come in contact with some of the diseased cattle which are constantly brought to this town. We have in this borough at this moment pleuro-pneumonia raging among the cattle—77 head of cattle have already been sent to slaughter during the three months just past. Yesterday I was called upon to examine the carcass of a cow sent to be slaughtered with that disease, which belonged to a widow, who a month since had seven

fine cows, but now she has only one left, having lost six by disease. I could give scores of such cases.

May I venture to refer to the Bills before Parliament for the Prevention of the Spread of Disease among Cattle. These bills propose to exclude from markets and fairs, cattle affected with contagious disease, and to prevent them travelling by road or rail. If owners of diseased stock are prevented disposing of their diseased cattle, it appears to me, from my experience of them, that they will slaughter them upon their premises—and I really do not see anything in the proposed bills to prevent them ; and if so, what is to hinder them from selling the carcasses of such cattle to butchers who traffic in such carcasses, or if they like it better, to send them by the score to the London dead-meat markets ?

I am decidedly of opinion, that unless a general and effective system of inspection be introduced into the bills, they will be little more than a dead letter. You may depend upon it, that the farmers in the farming districts will not appoint cattle inspectors, for the very reason I have suggested ; because, if he did his duty he would prevent them disposing of their diseased carcasses, and unless supervision extended over the whole of the grazing districts, the bills will be worse than useless. In my opinion, the most effectual mode of preventing the spread of disease among cattle, would be for the Lords of the Privy Council to appoint eminent experienced veterinary surgeons, as cattle inspectors over counties or divisions of counties, with authority to act under the provisions of the proposed bills, and also in all matters relating to diseased cattle and diseased meat. I am strongly of opinion that unless such professional inspectors be appointed, there will be a number of inexperienced persons chosen who know nothing whatever of the diseases of cattle, or the condition of a diseased carcase. One eminent professional man would be worth a hundred of such inspectors. We have at present, nuisance inspectors who are bricklayers, masons, shoemakers, and tailors, and who are the only authorities that can act under the provisions of the Nuisance Removal Amendment Act (1863), except in those places where there are medical officers of health. No doubt such persons may discharge well their duties as inspectors of nuisances, and I know some who are efficient public officers. But in the matter of diseased cattle, and diseased meat, it is quite another thing. They cannot be of that service to the public in matters upon which they are totally ignorant. In this country there are large and important towns where diseased cattle and diseased meat are constantly taken without fear of detection. I hold that a cattle or meat inspector should be experienced, not only in the various qualities of meat, but should have more knowledge of the disease to which cattle are liable.

There are various opinions as to whether an experienced butcher



or a veterinary surgeon would make the best inspector; I say combine the two, and the work will be well and properly done. With all my experience—and I have had as much as most inspectors, having, during six years ending December 31, 1863, condemned no less than 2085 carcasses of diseased animals—I should be exceedingly glad to be enabled to consult professional skill in matters of doubt and difficulty.

[We have received a report from Dr Bishop confirming Mr Higgins's statement as to the communication of the foot-and-mouth disease from cows to man, by the milk. We found the milk highly charged with pus corpuscles, and having a remarkable disposition to decompose. Similar milk had been often examined before by Dr Bishop, and considered highly unwholesome.—ED. VET. REV.]

# EDINBURGH VETERINARY REVIEW

AND

## Annals of Comparative Pathology.

---

### THE SUMMER SEASON, AND VETERINARY EDUCATION.

THERE is a time for all things; and perhaps no time so suitable for consideration of plans of work as when we are indulging in a little repose; though this should also be well-timed, or it becomes questionable whether any real advantage be derived from mere cessation of labour.

We are led to a train of thought, one of frequent recurrence, especially as this month of May comes round, when, seeing everybody and all nature full of animation and activity, with the sole exception of the cultivators of veterinary science, we see the majority of the young men who began their studies in veterinary medicine at the several schools of the kingdom in the autumn of 1862, have now, in conformity with the decree of the powers that be, been sent forth in April 1864 as duly qualified members of the veterinary art.

Far be it from us to insinuate that the gentlemen of the present or any recent year, have not gone forth at least fully as well prepared as those of any former period within the seventy-two years which have elapsed since the veterinary art was first recognised in this country; still, viewing the question with regard to the earlier and recent periods, and the measures taken relatively, instead of leaving a satisfactory impression, the conclusion arrived at, and the importance of the subject, force us to look seriously into the whole matter again.

That the veterinary art belongs essentially to those of the first order, in so far as it constitutes a branch of human industry intimately connected with the well-being of society, few people will deny; and, assuming its importance as proven, the question to be submitted is,—Is it cared for and cultivated with that solicitude and earnestness befitting a calling so universally in requisition? Most certainly not.



We will not magnify the difficulties which beset the way of mastering a knowledge of Veterinary Medicine and Surgery in all required details; nor yet unduly exalt our notions of the position which veterinary surgeons should hold as members of the community. In the following paragraphs we purpose adding some facts, and of basing all our arguments on them.

In the first place, we assert as a fact, that no individual, be he ever so talented, willing, and industrious, can learn the veterinary art in the time now allotted, as sufficient to qualify for the diploma of the Royal College of Veterinary Surgeons; and further, it may be stated that there is no medical or veterinary school in Europe, besides the veterinary schools of this kingdom, which is not in full work at this season of the year; and here we will venture an opinion, and say that there are no other two months in the year in which so much progress in study and all kinds of work can be got through as in those early summer months of May and June. Why then dismiss the students of the second session in April with their diploma, and let the juniors go where they please or do what they can? And even supposing that two years' work be thought sufficient (though we consider five nearer the requirement), why dismiss the class in April, and not in the first week in August? Perhaps some will say, that each school may adopt the latter course, and every student may stay as many months and sessions as suits him. Such possibilities are not of a practical kind. Practically, schools and students will follow pretty closely the regulations laid down, from time to time, by the Royal College of Veterinary Surgeons; students and parents will regard the framers of the regulations in force as the reliable authorities whose dictates it is most prudent to follow; and schools and teachers must of necessity conform to the combined decisions of those who make the rules and of those for whom they are made.

That which passed as sufficient fifty years ago has long ceased to be so; in the early time of our Veterinary College a large proportion of the pupils were men who were already in practice, and who gave up a session which lasted from October to July, and students assembled from all parts of the kingdom, who, in addition to the few lectures delivered at the Veterinary College, with dissections and practice there, attended courses of the first teachers of the day in the various branches of human medicine. And insufficient as the time was, it must be confessed that ten months'

consecutive work enabled earnest men to return to their respective spheres greatly improved by their stay at college, with all the associations such institutions afford. Our school differed from every other veterinary school in Europe, and from the regulations established on the foundation of that very school; for whilst four years' residence at college was the minimum on the Continent, three had been regarded as sufficient at the London College, and instead of requiring any preliminary qualification or specified age, candidates of all grades and ages were admissible; whilst in France they were required to be fairly up in language, arithmetic, &c., and to be between sixteen and twenty-five years of age.

We would now ask, how is it that the past bad system, of which the foregoing represents a sketch, should never have been radically changed up to the present time?

It was under a vicious and bad discipline at our College that the free ingress and speedy egress of students was encouraged; but then education was at a low ebb—war, dearth, little time devoted to learning and much of it to labour, was the prevailing order; and though, during the last thirty or forty years, the whole face of things has been changed, in most other walks of life on education, only a little patchwork has been done—some mending, which is most illustrative of the parable, “No man putteth a piece of a new garment upon an old,” or “the piece that was taken out agreeth not with the old.” When, in due time, the profession obtained Her Majesty's Royal Charter, the status of the members of the Veterinary profession was improved, and became fully recognised; and we have no doubt that the privileges conferred by the charter were many; and such further concessions as time and circumstances may show to be necessary for our due efficiency may no doubt be obtained.

Englishmen and Scotchmen like realities and despise shams. If we take, for example, a look into the curriculum at the Medical Schools—for instance, at that which stands second to none, the Edinburgh University—we find that four years must be devoted to purely medical subjects, to qualify for practice; not merely four winter, but likewise four summer sessions; and that is not all—there are offices to be held which the best students aspire to fill, with which the educational course is prolonged to five, six, and seven years. This is worthy of the name of a thorough course of medical education.



If we put in comparison the substantial education afforded by the curriculum in force at the University of Edinburgh, with that which the student of veterinary medicine has submitted to, and been led to acquiesce in by force of custom; right-minded members of our profession will feel humiliated at the anomalous deception which has prevailed. It has been said, but never with a show of reason, that the veterinarian has no need of the extended course of education required by the practitioner of human medicine. Let us admit the atom of truth contained in the above sentence; it will not weaken our own case; and granting, as we do, that there always has been, and, we trust, will continue to be, inducements and charms in the science and art of medicine, to attract amongst the ranks of its devotees men of high standing in scholarship, and for their talents and virtues, this in no way affects the case with reference to our profession.

It seems to us that people mix up questions so as to lose sight of the only one relevant to that of the way to make the most accomplished body of veterinarians, suited for all the demands of the social commonwealth, and able to advance its own status amongst the institutions of the land. Very much the same kind of knowledge is required by the student of veterinary as of human medicine, both as to kind and quantity; and as much time and labour are necessary in the one case as in the other; the essential difference consists in the field of practical application. These differences in the calling, like that of the aspirations and earlier aims, tend to the modification of manners. One man passes his days and nights by the sick bed-side of his fellow-creatures; while the other learns and practises his art amongst the lower animals, and he is required to be trained, in accordance for the work, to much physical dexterity, in addition to a well-balanced mental culture and thorough knowledge of the fundamental parts, which are variously spoken of as veterinary science, theory, &c. Without those pillars, amongst which anatomy and chemistry especially hold the first places, a man cannot begin to think or understand anything of the practice of medicine, no matter to what living creature applied; with them, and much more that is closely allied, he may form a theory—a thought; ideas will arise, the practice will be regulated on the basis of correct knowledge, and a constantly increasing fund of sound thoughts will spring up.

To us it has always appeared strange that the framers of the bye-laws for the regulation of admission into the profession, as well as the candidates themselves, should have been so solicitous to find out the minimum amount of time and work that can be accepted at the examining Boards; like a jockey riding a race, who rounds the turns so close to the posts as only just to avoid striking against them. The cases, however, are so far essentially different, whereas the one wants to find the shortest way to the goal, the other should seek to attain the object of his mission, which requires time, the way being by a more circuitous route.

The present is a peculiarly fitting time to reconsider this question, and lay such views before our readers as may be likely to attract notice to the matter, in its varied aspects, because new demands of a varied kind are being made on the body corporate of veterinary surgeons. New fields of labour, not hitherto recognised, are being opened up. Formerly, the veterinary surgeon's assistance was called mostly to the horse; now, whilst the horse requires all the care he ever did, and their numbers, being greatly increased, more veterinary surgeons than heretofore are required for them.

Therefore, whilst a new course of instruction has to be established to meet newly-discovered requirements regarding the health of the live stock generally, and their relation to the health and interests of the community, all that applies to the horse requires to be gone into *di nuovo*—with a new zest; since much that has been taught on the matter, even assuming that the student had followed the master fully and faithfully out, will have acquired much that is burdensome, erroneous, and requiring to be laid aside as fast as more accurate knowledge can be diffused; for as drowning men grasp at straws, so will misled people keep to their errors until truth dispels them; nature will not tolerate a vacuum; the mind is always tenanted.

We are not going to prescribe a new curriculum of veterinary study and discipline; it will be time enough when the work of reform begins. There is yet much that encumbers the ground; and the time is not far distant when the whole question will be gone into.

There is one question more frequently mooted than any other in connection with the acknowledgment of something in the educational system being required, viz., regarding apprenticeship.



On that point we would make appeal to our own experience, and also to that furnished by the medical profession. In our early days, apprenticeship was universally adopted over England, and long and loud were the complaints in the Medical Faculty against its working. It was costly, prohibitory, slavish, and ineffectual for making able men, though some became able despite its fetters, as they would have done under even a worse system.

We always feel pity for the case of a youth placed in what may be called the false position of seeing sick patients before he has acquired any knowledge of the animal economy, which can alone enlighten him on the character of their ailments, mixing up compounds, too, without any knowledge of chemistry or characters. This is a beginning at the wrong end; and it is no palliation of the case to say that youths so placed acquire professional habits. Our own experience is, that bad habits are mostly acquired, sometimes absolutely vicious customs. It is not the cunning of a calling that takes labour and time to learn, but sound knowledge. Fill our young men with good, and the frivolous and the spurious will be rejected by them. As a matter of course, whatever be the relative merits or demerits of apprenticeship generally, the exceptions will be due to exceptionally able and good masters; but we are not arguing for exceptions, only for rules. The well-timed and properly-conducted studentship and assistantships are the means, we consider, best calculated to produce able veterinary surgeons, and that in a way the least irksome, least expensive, and most conducive to the interests of the profession and the requirements of the community.

To learn mechanical arts, probably a well-regulated apprenticeship of two or three years affords the only reliable mode; and we believe that there is one branch of the veterinary art—the art of shoeing—which can only be acquired by a routine work at the forge, such as apprenticeship admits of; but experience is available on this point also. And since we find thrifty, well-disposed young men ready to improve their condition in life, we may expect continually to find some who, beginning their career at the shoeing-forge, will find means to proceed to the study of veterinary medicine; and therefore we would encourage those, and dismiss the question of apprenticeship as a means of education for the aspiring veterinary student.

It occurs to us, whilst on the subject of men improving their

condition, or being ready for those perpetual changes always going on amongst families and communities, that there should be ample emulation to lead young men to go deeply into the science, as well as the art, of veterinary medicine, and never to take any heed of the minimum admissible stock. "What will you think when your son is dubbed veterinary surgeon?" we once heard addressed by a teacher to a father. "Why, nothing at all," was the answer, "unless we can be well assured that he is well informed on all the principles and details of his art." No calling should be better adapted than that of the veterinary art to enable rising young members of large families to seek new outlets in other equally useful, diverse, and sometimes higher walks in life.

Bred under circumstances likely to lead to a reverence for all natural pursuits, none could aspire to them and the arts and sciences better than well-trained sons of enlightened veterinary surgeons. And since men in the world are like bees in a hive—all in motion—the ploughman and the mechanic striving for intellectual enlightenment, whilst in turn the lawyer and the physician seek to take their share of ownership in the soil and foster its produce, so in these quietly-flowing tides, as a corporate body, we with our families have to take our place. Therefore, we shall conclude with a cry of—Down with all dabbling; give incompetence quarter only just long enough for it to get out of the way; and let us take for our motto Napier's words, when leading his few sailors and marines to take Acre, crying out, "Push on ahead, my boys, with all speed; no cheer for the hindmost!"

---

## RACING AS AN INCENTIVE TO THE PROMOTION OF THE BREED OF THE HIGHEST CLASS OF HORSE.

THE anniversary of the great race of the year having again come round, we may profitably devote some reflections concerning the influence the national sport exerts on the cultivation of a fine breed of horses to the highest perfection. Racing affords the only means of testing the real worth of the blood-horse for his varied capabilities for speed, power, and endurance.

The telegraphic report of the race for the Derby, which comes under our eye, whilst the sheets of this Review are passing from the press, is more than ordinarily interesting under the aspect



which mainly concerns us. A coincidence may be mentioned in connection with the Derby race of this year worthy of note ; it is often said on both sides of the Tweed, that racing is not well supported in the northern division of the kingdom. As we have before intimated, whatever of truth there be in these statements, there may be other causes than that of delight in the sport on the one hand, and more or less of apathy on the other.

Yesterday, on Epsom Downs, the best possible answer was given to those who assert that racing and a fine breed of horses is not appreciated by the Scottish aristocracy and men of business. The winner Blair-Athole, General Peel, and Scottish Chief, all belong to Scottish owners, and were trained by Scotchmen ; therefore, if the fact serves no other purpose, it proves that good taste, clear understanding, and executive management, abound with the natives of Caledonia.

It is some years since a Derby winner so convincingly established his claim to be called the best horse in England as Blair-Athole has done. With him there is no question of speed *versus* the intrinsic qualities of lasting, and all those required of horses to propagate the best type. An easy task is left for the prophets, to expatiate on what may be expected, if not relied on, from particular crosses of blood. Here we have a son of the best mare of her time, got by—to use William Harlock's words—the best horse in the world. Nothing, then, could be better ; and still we might have had all this, and the produce not worth fifty pounds.

Management in breeding is the thing not yet sufficiently understood ; good care is not at fault, all that is admirable—amounting, in many cases to fastidiousness ; but knowledge of all requirements is a very different matter. Whenever we have visited Malton, and been kindly shown over Mr I'Anson's stables and paddocks, we have had no difficulty in recognising the several causes which are combined in the whole, to produce such extraordinary good effects. We see in the foals and yearlings the foundation of hope, and reasonable anticipation of after progress. Bred on dry undulating ground—exposed to the cheering morning and mid-day sun—systematically well fed—their feet never seen in mire—the stock look firmer, stronger, and more shapeable than almost any that we meet with besides ; and when we saw Blair-Athole last, about fifteen months ago, he looked altogether superior to any other colt of his year amongst those which came

under our observation, and he has afforded us a study of no insignificant kind in the interval. As the horse has been well described by writers in the sporting journals, and will be further displayed by artistic means, we shall not dwell on many details. His beautiful neck, chest, shoulders, and loins, are the sources of his power and great speed. His knees and hocks are so beautifully constructed as to afford the highest degree of physical advantage for the exertion of that force, and his pastern joints and feet are conformably perfect with all above.

Kettledrum having ran over the Derby course, as reported, in one second less time than Blair-Athole, is no proof of the former being the faster horse. On the contrary, as in 1861, the race was hardly contested to the end; in the present year, Blair-Athole tailed off the whole field of horses, and had made both of his nearest competitors safe, and at last won as his jockey liked.

To have won in one second less time, Blair-Athole would have had to make eight more steps, in other words, to have exerted each foot twice on the ground, and that, we have no doubt, he was capable of doing if the second horse had kept up the pace.

Timing alone, can only afford an approximate understanding of the speed of the horses of different years. The state of the ground will make a difference of some seconds in different seasons, even though the race were run in the same way, and the horses were equal in form.

In conclusion, we can assure our readers that the structures which enabled Blair-Athole to show his competitors his tail, are no *suspensories*. Action, and not suspension, is the motto of the noble horse, in obedience to nature's design.

We congratulate Mr I'Anson on his continued success. Honour to him to whom honour is due. And we rejoice on behalf of our country, on the evidence afforded that our blood-horses are not degenerating where good management prevails.

We must trace back a few years, before we can point out Blair-Athole's equal, amongst the best of Derby winners; he may be looked on as a true representative by blood and form, and almost a repetition, of old Eclipse.



## ROYAL COLLEGE OF VETERINARY SURGEONS.

### —o— ANNUAL MEETING.

The Twenty-first General Meeting of the Members Politic and Corporate of the Royal College of Veterinary Surgeons was held by advertisement, and, in accordance with the provisions of the Charter, on the first Monday in the month of May, being the second day thereof, 1864, at the College, No. 10, Red Lion Square, Holborn, London.

**PRESENT:**—The President, Wm. Ernes, Esq.; Professors Simonds and Gamgee; the Principal Veterinary Surgeon to the Army, J. Wilkinson, Esq.; Messrs J. Allen, Hugh Anderson, H. T. Batt, Ed. Braby, T. P. Boughton, Jn. Broderick, G. T. Brown, Wm. Burley, Michl. Byrne, B. Cartledge, Edmond Charles, Wm. Cooper, Wm. Dale, Jas. Darling, Chas. Dickens, P. S. Dollar, Jn. Ellis, P. Ellis, T. H. Ford, B. C. R. Gardiner, Thos. Greaves, Edn. Harrison, Wm. Helmore, Michl. F. Healy, Dl. Hinge, R. L. Hunt, Heny. Hussey, Jn. Lawson, G. A. Lepper, W. D. Lines, C. Lowe, Dl. M'Lean, Richd. Mackinder, T. W. Mayer, P. Moir, Jas. Moon, Jas. Moore, Jas. Moore, jun., Wm. Partridge, Richd. Pritchard, Wm. Pritchard, Jn. A. Rostron, Alfd. Rushall, F. R. Silvester, F. Spratt, H. Stanley, Chas. Steel, Sl. Trimlett, G. Walters, Walker Watson, Wm. Wilson, S. H. Withers, Hy. Withers, Josh. Woodger, Ed. Woodger, Josh. Woodger, jun., and the Secretary.—Wm. Ernes, Esq., the President, in the Chair.

The Minutes of the preceding meeting having been confirmed, the Secretary proceeded to read the Twentieth Annual Report of the Council of the Royal College of Veterinary Surgeons, including the Treasurer's Annual Balance sheet, when

It was moved by Mr Brown, and seconded by Mr Wilson, "That the Report be received."—Carried.

Previous to the adoption of the Report, it was suggested by Mr Mayer, that, in future, any alteration of the bye-laws should be entered in the Annual Report.

It was moved by Mr Lines, and seconded by Mr Moore, "That the Report and Balance sheet be adopted."—Carried.

The meeting was addressed by Messrs Brown, Gamgee, Mayer, Helmore, and Lines.

It was moved by Mr Silvester, that Messrs Tremlett and Dale be appointed Scrutineers.

The election of seven Members of Council; six in the place of the following gentlemen, who retire by rotation, viz., G. Varnell,

Wm. Field, Js. Moon, Rd. Pritchard, R. L. Hunt, Jn. Lawson, and one in the place of Thos. Jex, resigned, was then proceeded with. The nominations were as follows.—Professor Varnell by Mr Lines, Mr Brown by Mr Cartledge, Mr Greaves by Mr Burley, Mr Lawson by Mr Silvester, Mr Hunt by Professor Gamgee, Mr Moon by Mr Ellis, Mr Field by Professor Simonds, Mr Gardiner by Mr Pritchard, Mr Harrison by Mr Lawson, Mr Partridge by Mr Wilkinson, Mr Dickens by Mr Mayer, Mr Jas. Broad by Mr Woodger, and Mr Pritchard by Mr Dickens.

The following was the result of the ballot:—Jn. Lawson, 45; R. L. Hunt, 37; Professor Varnell, 35; C. Dickens, 28; G. T. Brown, 28; Jas. Moon, 27; Thos. Greaves, 25; Jas. Broad, 24; Richd. Pritchard, 23; Wm. Field, 18; Edn. Harrison, 11; B. C. R. Gardiner, 9; Wm. Partridge, 5.

Messrs Lawson, Hunt, Varnell, Dickens, Brown, Moon, and Greaves, were then declared duly elected.

It was decided by the President, by lot, in accordance with the provisions of the charter, that Mr Lawson fills the vacancy occasioned by the resignation of Mr Jex.

It was moved by Mr Lawson, and seconded by Professor Simonds, "That the thanks of the meeting be given to the President, Wm. Ernes, Esq., for the very able and courteous manner in which he had conducted the proceedings of the day."—Carried unanimously.

The principal business of the meeting was to receive the annual report, and to elect six gentlemen as members of the Council, in place of those retiring by rotation. The Secretary having read the minutes of the previous annual meeting, proceeded to read the 20th annual report, which set forth the draft of a bill to be introduced into the House of Commons, prepared by a special committee of the College, and revised by Mr Garrard, their legal adviser—having for its object the improvement of the position of Veterinary Surgeons. The balance-sheet showed that the Society was in a favourable condition; the balance at banker's was stated at L.420, being in excess of the balance of the previous year of L.125, 5s. 4d. The adoption of the report having been moved and seconded,

Professor BROWN said, it was gratifying to observe that, although they had not yet obtained the privileges to which they had a right, their efforts would not cease until they had obtained a protection bill making it penal to practise without a license. He objected to the 3d clause of the Draft Bill, in which was the following passage,—“For the same reason, a boot and shoe maker might be considered competent to medically treat his customers, than which nothing could be more ridiculous.” As there were always men ready to oppose any measure, it was incumbent upon its promoters not to advance arguments that could be easily upset. Unhappily for the reasoning in that clause, veterinary



surgeons were in a sense boot and shoe makers, and though it might be desirable to separate the trade of farrier from that of veterinary surgeon, yet, under present circumstances, their union seemed indispensable. It appeared to him that the allusion cut both ways. If he might trespass on their time for one moment longer, he would just observe that it was a great pity, while there were so many veterinary surgeons in London, that there was no Central Society for the members of their profession. In Leeds, and in other large provincial towns, there were societies in a flourishing state, and he hoped before long there would be one in the metropolis.

Professor GAMGEE—Mr Chairman and gentlemen, I quite feel with Mr Brown, that the objection he makes to this sentence is well-founded. It struck me on reading it that a word or two might have been introduced to modify that which may shock the eyes and ears of some persons. My object in rising is to draw attention to a matter of serious moment. Several years since, I believe I was the first to show that the number of veterinary surgeons in this country was quite inadequate. I was constantly addressed by members of my own profession in different parts of the country, as to what would become of the many veterinarians qualified every year? "What are you going to do with them? Fifty every year from London, fifty from Edinburgh, the country will soon be over-run with veterinary surgeons." Instead of the country being over-run, we find that there are still wide tracks of it without veterinary surgeons. What I showed several years back has been demonstrated by the statistics collected through this college,—namely, that empiricism has flourished to an extent that we could scarcely have expected considering the progress of veterinary education during the last twenty or thirty years. It is my impression that one great cause of this scantiness of veterinary surgeons over the country is, that in districts where they are really most wanted, they cannot, for a number of reasons that I need not at the present moment assign, obtain a proper livelihood. The way undoubtedly to strengthen the position of the profession throughout the United Kingdom is to secure not only that we have admirable veterinarians, but also that we have for them a competent living. I need scarcely tell you, that, although many men speak of the necessity of curing the souls and of curing the diseases of men, apart from any pecuniary considerations, it is found essential, in order to support the dignity and advance the usefulness of the medical profession, and the same with the clerical profession, to secure to them a good and substantial income. The standing of professional men rises in proportion to the emoluments which they receive. It is one of the grandest impulses we have to exertion in this country. It is necessary, especially where we find people flourishing in art and trade, that we should have the means of an independent

existence, in order that we should assert our rights and position throughout the country. I therefore think, if I take this Report as a guide, that the number of veterinary surgeons annually brought up seems rather to be decreasing. It is evident that we must aim at making each individual veterinary surgeon so far superior to any empiric, that he may force himself on the attention of the public; and I have no doubt whatever, that if we can demonstrate that we are worth pounds, shillings and pence, remuneration will come. If cotton is worth the money, it soon reaches our ports; if butter is wanted, pay for it, and butter comes; if you only pay for good veterinary surgeons, you will get them, but if you do not pay for them, you cannot have them. I really take this view of the matter—you will say, perhaps, not a very exalted view. Nevertheless, I feel that there is much truth in it; I observe, for example, this year, that there are 68 new members of the Royal College of Veterinary Surgeons as against 90 last year. I unhesitatingly affirm that, instead of 68, we ought to have 168 annually brought forward. I will tell you why—not probably that the full number of 168 would, in the long run, be required; I believe they would, but possibly that number would not be required to fill the gaps, and to supply the wants of the community generally over the country. But, as I have always insisted, we cannot expect, should we get 168 gentlemen to enter the profession annually, that they will all remain with us; we cannot expect that they will all attain to the position of practising veterinary surgeons. The public will exercise its right of selection; the best will win, and the weak will fall back. But you must remember that the United Kingdom has yet to be supplied. Disorders are raging to a frightful extent, and we cannot really spare a single man, much more provide for the hundreds and thousands who are actually needed in Canada, Australia, India, and in many other parts, with the progressive development of agriculture and industrial pursuits. On the subject of veterinary education, it is necessary that some few words should be said. I believe the Council of the Royal College of Veterinary Surgeons would do well—

Professor SIMONDS—Pardon me, I think you are somewhat out of order; the Council have nothing to do with the education of the veterinary pupil.

Professor GAMGEE—We have a great deal to do with the examination of the veterinary pupil, and that is what I am coming to.

Professor SIMONDS—Yes; with the examination, not with the education.

Professor GAMGEE—With the examination; that is what I am specially coming to; I am obliged to pass through one channel in order to reach the other. I wish simply to state that the veterinary colleges in this country, now three in number, in



active operation, and one in embryo, are to a certain extent actuated by motives which are peculiar to each of the four individually; and I trust the whole four may be actuated by motives which relate to the general good of the profession. There are difficulties in the way of the veterinary colleges combining, so as to secure that the educational standing shall be elevated *pari passu* with the social standing of the veterinarian. I believe the veterinary students of the present day are better than the veterinary students of twenty years ago. I believe that the veterinary surgeons that are made in the present day are decidedly in advance. We are not going back; but, as in every other profession, we are getting a better educated class of young men. Naturally, with a better material, we can make a better compound, and undoubtedly the veterinary profession is rising; but in our own sphere of professional education, unfortunately, the advance is not such as it would be desirable to obtain. If I may suggest one way in which the council of this college can probably aid in inducing a development in the system of veterinary education itself, not that these changes can be effected suddenly, but through time, by adopting a system which has lately attracted very much attention in the medical world, of having examinations for the elementary sciences at one period, and examinations of a practical kind at another period. I think it is fair to the veterinary student, that by the time he has successfully crammed his anatomy, his chemistry, and his physiology, that he should then have the opportunity of being thoroughly tested in his knowledge of those sciences, and perhaps tested in a more complete manner than he is at the present day. He can then be left perfectly free during the after-period to work at practical subjects, and then this college can effectually test him upon these points. I think the time has arrived when the students in our schools can afford to pay the former fee of ten guineas. It was reduced to seven. I believe our students would as willingly pay the ten as the seven. Then there could be no difficulty in having an examination at one period which should cost five guineas, and another examination at another period which should also cost five guineas. That arrangement, instead of interfering with the income of the college, would largely augment it. And it is essential, I think, in order to secure an increase in the number of our students, and in order to increase the prosperity of the college itself, that certain departments of study should be added—departments of study which are partially gone over, but which it is impossible, without some extension of the curriculum, to grasp. At the present moment, fortunately, the whole country is turning its attention to sanitary questions, in which the veterinary profession must play a most important part. The veterinary surgeon will be needed now where he was not needed before; the veterinary surgeon, indeed, will have to

look at diseases in the lower animals from a totally different point of view, as a comparative pathologist. In this sense he will find occasions, when he will be raised to the level of the members of the sister profession, when he can largely assist them, and largely co-operate with them, and advise them in a very desirable manner. The section which must be added to the curriculum, and concerning which the council must take some pains to consider whether it will not be desirable to add a table to their examining board, is the section of natural history. I hold that if we proceed for the next four or five years, without very seriously considering the desirability of testing the knowledge of the veterinary student on such subjects as zoology and botany, we shall fail in doing that which we owe to the country, and that which, indeed, we owe to the schools, because the schools will flourish in proportion as the students are accomplished veterinary surgeons, and prove themselves useful throughout the kingdom. If you will allow me to go on, for we have only one opportunity in the course of the year of meeting and talking to each other, I will crave your indulgence for a few moments longer. I speak because I feel the great importance of these matters, and because I feel, as members of the same profession, that we have not the opportunity we ought to have to open our minds to one another, and to talk over our ideas, on the present occasion, of natural history. I hold it absolutely essential that the veterinary surgeon should have a basis of knowledge in zoology, botany, and geology, not to be treated by three different professors, but to be treated by a professor of natural history. I constantly find, that veterinary surgeons are incapable of grasping certain of the fundamental ideas with regard to the distribution of diseases, because they have not understood the laws which govern the geographical distribution of certain geological strata, and the geographical distribution of animals and plants. Now I certainly know from experience, from travelling, and from investigation in different parts of the country, that if I go to certain districts in Ireland, I can there find special diseases of animals; and if I go to certain districts in Scotland, I can there find special diseases of animals not found elsewhere. People might live for a century in London, and never hear of certain maladies which attack cattle, sheep, and other animals in this country. I lived two or three years in Edinburgh, and never heard of the existence of such a disease as the cripple, or fragility of bone, which I had been in the habit of describing in my lectures as constantly occurring in central Europe. I never knew that I should find it within forty miles of Edinburgh, or that I should find it in certain districts in Ireland. Again, you have the periodic ophthalmia of horses which is confined to certain districts. Why should we not see it in Edinburgh, but find it always in Liverpool. It is the same with the distribution of



animals themselves. We have the Natterjach Toad in the county of Kerry, and we do not get it in any other part of the country. Unless we have a good foundation of natural history, we cannot understand this and other phenomena of the same kind. But the value of the study of natural history starts out in a remarkable manner, when we consider the subject of helminthology, relating to the material parasites, concerning which so much has been learned of late years, and of which so little is known by both the medical profession and the veterinary profession combined. I do not wish to put you behind the medical profession in this respect. I was speaking to a member of the medical profession this morning, a most eminent man in his profession, and he told me he was recently in Wolverhampton, where individual medical practitioners confess to having from two to three hundred cases of tapeworm every year under treatment, without knowing it came from eating measly pork. We have between one and two per cent. of flesh-disease in man; and if it is so prevalent in man, it must be equally prevalent in the lower animals. There are also many points in comparative pathology to be known, without which it is impossible to understand many of the diseases in the lower animals. I have drawn attention to the fact that it is absolutely essential that botany, geology, and zoology should be studied in a course of natural history. Until we do that, we cannot expect that veterinary surgeons can hold with credit to themselves the positions which I hope they will very soon hold as inspectors of stock and inspectors of provisions throughout the kingdom; positions which, I trust, will give them large emoluments; and positions which, I trust, will in course of time tend to raise them in the opinion of their countrymen. I will not now enter at length into these points. I only wish to impress upon your minds that it is expedient, in the first place, that we should assert the importance of our profession by our education; and in the next, that we should insist upon the importance of our profession by pulling together, and having numerous opportunities for discussion. I think what is done in the Medical Council should be done here; that at our monthly meetings, where important discussions take place, we should have reporters present. We should then, in course of time, attain to something like a general understanding as to what is desirable, and what is not. As to the past, veterinary colleges have worked in one way, and veterinary surgeons have worked individually in another. There has not been that union which is strength. There has been no practical way of bringing it about, and the only way in which it can be brought about is by our combining together under the banner of the Royal College of Surgeons. Since 1844, we have made but little progress; but I trust we may now have a starting point for something better, and something more durable.

Mr MAYER said he quite agreed with many of the remarks that had fallen from the last speaker. It was essential that they should have well-educated men in the profession, and that they should have the same rights as were claimed by the sister profession. As soon as they attained that, they would have a better class of men joining their college directly. There were many who called themselves veterinary surgeons, but *there* was a great difference between a self-styled veterinary surgeon and a member of the Royal College of Veterinary Surgeons; and there were many who passed themselves off as members of the College, by styling themselves "Members of the Veterinary College." These men very often, by their ignorance, cast disgrace upon the College; and there was nothing as yet to prevent them from doing as they did. He was extremely gratified with the steps that were being taken to remedy the evil.

Mr HELMORE said he agreed with Mr Brown, that the reasons given by the Council for applying for an Act of Parliament, were not such as should emanate from a society possessing the dignity of a Charter of Incorporation. He would illustrate what he meant by quoting an extract from the document itself:—"These persons (empirics) are generally the first to attend the maladies of domestic animals, and if the veterinary surgeon be sent for, the case is but too often at that time beyond all chance of recovery, it having been so long tampered with by the empiric. If, under these circumstances, the veterinary surgeon prescribes, he is sure to get blame, for should the patient recover, the empiric will spread about that his treatment, and not that of the veterinary surgeon, effected the cure; or if, on the contrary, the patient dies, which probably in nine cases out of ten it will, the empiric will then say, 'the veterinary surgeon had killed him; and that had the animal remained under his care, he would have recovered.'" He objected to the wording of this portion of the suggestions. In his experience he had not found it to be as there stated, and he objected altogether to its insertion.

The CHAIRMAN said, that the experience of the Council justified the remarks they had made. He was the author of the statement, and he did not insert it without a practical knowledge. He had been informed that in distant parts of the country the empiric was always the first called in; if the animal did not recover, then the veterinary surgeon was sent for; and then the quack ran from public-house to public-house declaring the animal would die, for he was in the hands of the "Vet."

Mr HELMORE said, men in that position deserved their warmest sympathy, but for all that he did not think either the reason or the language suitable under the circumstances. He agreed with Professor Gamgee, that the education of the veterinary surgeon should be raised, in order to get a better class of men introduced into the profession; although, so long as gentlemen in the country



preferred the empiric to the veterinary surgeon, empiricism would always flourish. He wished to ask whether gentlemen who came to the college, but did not pass the college examinations, were to be excluded from using the name of veterinary surgeon?

The PRESIDENT said, in France, if a man failed to obtain a diploma, and yet took the title of veterinary surgeon, the law was put in force directly, and he was punished, and was held liable for damages to the nearest veterinary surgeon. The object of the act was to prevent people assuming the title of "Member of the Royal College of Veterinary Surgeons." He had heard that persons had called themselves members of the college without having obtained the diploma.

Mr BROWN said, he had seen an instance of a printed bill-head, with "Member of the Royal Veterinary College" written underneath the name, not "Member of the Royal College of Veterinary Surgeons." It was an ingenious alteration, and he did not notice it at first. He wished to know whether a man would be entitled to call himself a member by merely paying his fee, or whether it would be necessary for him to obtain a certificate.

Professor SIMONDS said, it never had been so; a person, by paying the fee, was not entitled to call himself a Member of the Royal College of Veterinary Surgeons.

The PRESIDENT remarked, that a clause in the bill would give the members of the profession the same privileges, as regarded not serving on juries or in the militia, as the members of the sister profession possessed.

Mr MAYER thought the clause last referred to had better be drawn up in the same way as the clause of the Surgeons' Act, and not as it was at present. It appeared to him, also, that when the bill was to be agitated, it would be advisable for their solicitor to have a form of petition ready to be signed by members of the profession, to be sent to the House of Commons.

The PRESIDENT said, the Council had well considered the wording of the clause referred to, and had resolved to send it in the form laid before them.

Mr LINES said, in rising to move the adoption of the report, he would state, that he had been expecting to hear some reasons why the bill should not be proceeded with at once, so that they should, as soon as possible, be freed from the objectionable practices to which they were subject.

Mr MOON seconded the motion.

The PRESIDENT said, at first the Council very eagerly accepted the bill, and adopted all the clauses, making but slight alterations, but afterwards they became afraid, and had legal advice, when it became altered from a private to a public bill. It was his opinion, that it ought to have gone in as a private bill and not as a public one; he thought it would then have stood some chance of success. They would never have a good class of veterinary sur-

geons unless they secured for them a good livelihood. The bill was to meet this want, for it would not interfere with any one in practice at the time of the passing of the bill; but it protected the regularly qualified practitioners from that date.

The report was then adopted, and a vote of thanks unanimously presented to the chairman, for his impartial conduct in the chair.

### NEW MEMBERS OF THE PROFESSION.

At the several meetings of the Court of Examiners of the Royal College of Veterinary Surgeons, the following gentlemen passed their examinations, and were admitted members of the body corporate:—

#### STUDENTS OF THE ROYAL VETERINARY COLLEGE, LONDON.

##### *April 21st.*

MR W. F. H. CHATTELL, London.	MR ARTHUR NEW, London.
... CHARLES F. PHILLIPS, London.	... JOHN MILNES, Gloucester.
... JAMES M. BROAD, Bath.	... J. A. ROSTRON, Bolton, Lancashire.
... F. C. BOULTER, Plumstead, Kent.	... RICHARD POYSER, Wirksworth,
... PETER ELLIS, Liverpool.	Derbyshire.
... FRANCIS H. RIDLER, London.	... BOWER TALBOT, Whatton, Notts.
... ROBERT S. BLEE, Truro, Cornwall.	

##### *April 22d.*

MR HENRY LLEWELLYN, Tredegar, Monmouthshire.	MR JOHN SIMPSON, junior, Liverpool.
... WALTER THURSTON, Fressingfield, Suffolk.	... THOMAS TILSLEY, Berriew, Mont- gomeryshire.
... HENRY HOGBEN, Lyminge, Kent.	... THOMAS P. HOUNSELL, London.
... EDWARD CRESWELL, Hanbury, Bromsgrove.	... W. COLBECK, Barnsley, Yorkshire.
	... R. LINEKER, Balderton, Newark.
	... JAMES TAYLOR, Essex.

##### *April 25th.*

MR CHARLES M. RAWLINGS, Wells, Somersetshire.	MR T. RICKABY, Hungerford, Berks.
... CHRISTOPHER WILLIAMSON, Beacons- field, Bucks.	... WILLIAM HENRY A. VERNEY, Stow- on-the-Wold, Gloucester.
... J. A. POLDING, Bury, Lancashire.	... WILLIAM WALKER, King's Lynn.
... GEORGE BOURDASS, Bridlington.	... W. F. RUSSELL, Princes Risbow.
... HENRY HILLS, Cambridge.	... G. F. BOLTON, Paris, Canada West.
... CHARLES E. BORMAN, Tetney, Lin- colnshire.	... H. K. SHAW, Sydenham, Kent.
... WILLIAM B. EDMONDS, Hounslow.	... MATTHEW CLARKE, Thorpe Market, Norfolk.
	... JOHN P. BERRY, Northampton.



## FROM THE NEW VETERINARY COLLEGE, EDINBURGH.

*April 27, 1864.*

MR WILLIAM DOUTHWAITE, Beverley, Yorkshire.	MR JAMES KEANE, Charleville, County Cork.
... JAMES HORSBURGH, Dalkeith.	... ROBERT ARMSTRONG, Annan, Dum- friesshire.
... R. BAILLIE, Edgehead, Dalkeith.	... GEORGE FRANCIS LAMB, London.
... CHARLES JOS. WHITWORTH, Boston, Lincolnshire.	... WILLIAM EDWIN LITT, Shrewsbury.
... GROSVENOR H. PEMBERTON, Sedgley, Staffordshire.	... WILLIAM FORDIE, Glasgow.
... DANIEL GIBBON, London.	... DAVID CUTHBERT SMAIL, Blair- gowrie, Perthshire.
... JONATHAN RINGROSE, Weaver- thorpe, Yorkshire.	... JAS. DUNLOP, Dreghorn, Ayrshire.
... WM. HENRY BROOKS, Grantham, Lincolnshire.	... ROBERT BRYDON, Burncastle, Ber- wickshire.

## FROM THE EDINBURGH VETERINARY COLLEGE.

MR PETER MOIR, Edinburgh.	MR J. TAYLOR, County Down, Ireland.
... GEO. WEBSTER ANDERSON, Rayne, Aberdeenshire.	... HUGH JONES, Llanllyfri, Caernar- von, Wales.
... WILLIAM. C. LAWSON, Bolton, Lancashire.	... FRED. DANBY, Holtby, Yorkshire.
... JOHN SMITH, Ulverton, Lancashire.	... DAVID ROWLANDS, Llanrhaidr-yr- Mochant.
... JOHN HENRY RHODES, Manchester.	... THOMAS BARKER, Stokesley, Cleve- land, Yorkshire.
... THOS. STOKOE, Hay, Breconshire.	... DAVID MACLACHLAN, Paisley, Ren- frewshire.
... ROBERT HALL, Sedgefield, Durham.	
... W. GOULD, Pendleton, Manchester.	
... JAMES MARTIN, Brookville, County Meade, Ireland.	

## SPECIAL MEETING OF COUNCIL.

A Special Meeting of Council was held May 24, 1864.

PRESENT:—Professors Simonds and Gamgee, Messrs Braby, Brown, Burley, Ellis, Ernes, Greaves, Hunt, Lawson, Moon, Robinson, Silvester, Wilkinson, Withers, and the Secretary.  
—Wm. Ernes, Esq. in the Chair.

The Minutes of the preceding Meeting were read and confirmed.

The election of a President for the ensuing year was then proceeded with.

It was moved by Professor Gamgee, and seconded by Mr Lawson—"That Mr Hunt be elected President for the ensuing year."

On the ballot being taken, Mr Hunt was declared duly elected.

Mr Hunt, having taken the Chair, returned thanks for the honour of his election.

It was moved by Mr Silvester, and seconded by Mr Secker—"That a vote of thanks be given to the late President for the energetic and able manner in which he had discharged the duties of his office during the past year."—Carried.

Mr Ernes returned thanks, and at the same time handed to the President the official key of the Royal Charter and Seal.

The election of six Vice-Presidents was then proceeded with.

The following gentlemen were proposed:—Mr Helmore, by Mr Lawson; Mr Robertson, by Professor Gamgee; Mr Pritchard, by Mr Robinson; Mr Harrison, by Mr Wilkinson; Mr Broderick, by Mr Ernes; Mr Gardiner, by Mr Ellis; Mr Burrell, by Mr Withers; Mr Goodwin, by Mr Moon; Mr J. R. Cox, by Mr Silvester; Mr Thacker, by Mr Wilkinson; Mr Harpley, by Mr Burley; Mr Sparrow, by Professor Simonds.

The result of the ballot was, for—

Mr Goodwin, 16; Mr Harpley, 12; Mr Pritchard, 9; Mr Harrison, 9; Mr Thacker, 8; Mr Helmore, 8; Mr Cox, 7; Mr Robertson, 7; Mr Broderick, 6; Mr Gardiner, 5; Mr Sparrow, 5; and Mr Burrell, 1. Whereupon Messrs Goodwin, Harpley, Pritchard, Harrison, Thacker, and Helmore, were declared duly elected.

It was moved by Professor Gamgee, and seconded by Mr Ellis—"That Mr Coates be elected Secretary and Registrar for the ensuing year."

On the ballot being taken, Mr Coates was declared unanimously elected.

By Order of the Council,

WM. HENRY COATES, *Secretary*.

---

## PERISCOPE.

---

### ON THE IDENTITY OF PLEURO-PNEUMONIA AND RUBEOLA.

By W. THOMSON, M.R.C.S., &c. (Read before the Medical Society of Victoria.)

(From the Melbourne Argus, March 10, 1864.)

MR PRESIDENT and GENTLEMEN,—The havoc among our herds caused by pleuro-pneumonia gives interest to every circumstance connected with the malady. This interest is deepened by the mystery surrounding many things concerning its history—as to origin, nature, preventibility, or treatment. The alarm of the past has not subsided, but is continued into anxiety for the future; for the ravages of the disease are nearly as severe as ever, and opinions nearly as much divided about the most efficient means of staying them. It becomes, in consequence, of the utmost importance to elucidate, if possible, the points about which these differences exist, so that concerted efforts may be directed with the precision only practicable after a full and exact knowledge is gained of the disease they would aim to exterminate. To this end it will be even useful to prove a negative; for by showing what the disease is not, we come by so much the nearer, in the process of elimination, to the discovery of what it is. How much more, then, if we can determine a positive, and give the disease its proper place in nosology? To show that this is possible is the design of the few following preliminary observations. Preliminary, I repeat, because they are necessarily introductory and cursory, and made more with a view to lead discus-



sion into a new direction than to deal exhaustively with the subject. At a future time this also may be systematically attempted, in order to elaborate more fully the views which I will now proceed to lay before you. To know that the disease has not hitherto been satisfactorily defined, it is enough to refer to any author who has treated of the question. By much laborious inquiry, close observation, and keen discussion by men of the highest order of talent, many facts relative to the affection have been established beyond further dispute; but by the same men it is with equal candour admitted, that its true nature and affinities still baffle research, and remain among the *questiones vexatæ*. The name originally given to the disease, adopted as descriptive of the most prominent symptom, has long lost its significance, is now a misnomer, and is retained conditionally, as involving nothing theoretical, until a true one be suggested. No one has been as yet offered as a substitute upon scientific reasons; but the term which merely denotes, faithfully, it is true, one of the leading phenomena will be no longer used after the discovery of the exact nature of the disease shall indicate a more appropriate title. This fallacy of name has been the source of much perplexity and difficulty, particularly to those who were already familiar with the corresponding condition in human pathology; for they naturally applied old arguments to a new condition, on the presumption that the two were alike. It has likewise led to serious errors of treatment; for medical reasoners have affirmed that the one disease cannot be infectious because another of the same name and of the same organs is not infectious. These reasoners have given primary attention to one part, and taking that for the whole, have proceeded in their partial view, overlooking the main portion, and therefore have gone far astray, taking those along with them who trusted to them as guides. I do not affirm that every one has so reasoned, but I affirm that many have done, and continue to do so, perpetuating all the confusion of ideas, and presenting facts in a light in which they are apparently contradictory, but which, if seen in another light, would be quite clear and reconcilable. This was excusable at first, when all was necessarily dark; but it will be no longer so when the true import of the most fatal condition becomes plainly understood. That the disease is no longer considered by the best authorities mere local inflammation is well known; on the contrary, it is now fully recognised as, and is pronounced to be, a true zymotic fever, the affection of the pulmonary organs, originally supposed to be the only seat of disease, being a consequent—a specific consequent; that is, whenever the disease runs on to the second stage it invariably assumes the form of an irregular inflammatory or congestive state of the respiratory system. That there is a primary stage, at which the fever may cease and complete itself, is quite evident. In some cases it is so mild as to escape notice. Now, one great peculiarity of all zymotic fevers is that of having a primary and a secondary course, each of definite relation the one to the other, the first giving all the immunity from a second attack as completely as if the second also had been passed through, which is nevertheless an essential part of the disease. Every one of these fevers has its primary stage running a certain well-defined course, and every one has the correlated special local complication or sequela. For instance, if indeed instances need be alluded to, in scarlatina there is the peculiar febrile state proceeding with the utmost precision, and with the cessation of which the disease may end. If it do not, but pass onwards to the second state, an equally definite affection of the kidneys follows. This is invariable. We never find disorder of the lungs, liver, or stomach constituting the second stage of scarlatina; if the disease be protracted beyond the first stage, it is in the form of a renal affection. Renal disease with general dropsy without prior scarlatina there may be, but this idiopathic form is wholly unlike the specific form, however closely resembling it. Then there is typhoid fever, followed by intestinal ulcerations, with equally unfailing regularity. The fever may subside, or be subdued by treatment in its first stage, but if the second supervene, there is no escape from the inevitable enteritic disease. Small-pox has its peculiar sequelæ in erysipelatous inflam-



mations of cellular, glandular, and articular parts, and a peculiar dyspnœa. In measles there is the invariable bronchitis, or pneumonia, or pleurisy. Other complications, as of the nervous system or digestive organs, may be superadded, but the affections of the lungs are never absent. Thus, then, we observe that in all these eruptive disorders there are two distinct periods, each complete in itself, but inseparably related in pathological cause and effect to each other. A fatal issue may take place in either stage, but such a termination occurs from totally different causes in each, or rather the mode of death is different. Then, again, these periods are never mixed up in the different exanthems; nor are the secondary phases altered, nor the morbid states substituted the one for the other. The same patient may suffer from measles with pneumonia, scarlatina with renal dropsy, small-pox with erysipelas, typhoid fever with enteritis, all in succession; but no one ever heard, at least in the ordinary course of disease, of renal dropsy after typhoid fever, nor ulceration of Peyer's glands after scarlatina. These facts are so well known as to constitute a true pathology, and give to this department of physic a fair claim to the exactness of a science, whatever may be denied to the therapeutics which is endeavoured to be founded upon it. The group of diseases so singularly characterised, and having so many striking resemblances, yet exact specific differences, has received different appellations, according as it was wished to signify a theory of their common origin, or to describe some pathognomonic symptom. Thus they are classed together as zymotic fevers, from the supposed origin and cause; or they are termed exanthemata, or eruptive fevers, from the eruption or efflorescence on the skin; or contagious fevers, from their qualities of communicability to those susceptible to their poison. But we never speak of the group by the terms applicable to or descriptive of anything connected with their secondary, yet not less exact, states, nor of any of them individually in this way, unless it be of typhoid fever, although even in that case we never say enteritic ulceration to signify typhoid or pythogenic fever. It belongs also to these fevers, as a characteristic, that they never occur in isolated cases, nor ever fall upon a whole community suddenly and simultaneously. They are always epidemic. But epidemics are of two kinds—the non-infecting and the infecting. The former happens when, as is supposed, from some unknown change in the air, or in the magnetism of the earth, a morbid influence suddenly seizes a large proportion of the inhabitants, laying them for a time prostrate in sickness, and then with the cessation of the general exciting cause as suddenly and simultaneously disappearing. A good example of this form of epidemic is seen in any ordinary invasion of influenza. It is not infectious; and one attack gives no security against any number of subsequent attacks, when exposed to the same causes. The second form of epidemic is that in which an equally unknown morbid element is brought amongst a people by some person under its influence, from whom it is transferred to others, and from them propagated over all who are susceptible, until the whole are infected. This form of epidemic rages irrespective of season or of atmospheric or telluric conditions, until all suffer who come within its influence, when it dies out, for want of *pabulum* as it were. Examples are too well known in the histories of epidemics, of measles, scarlatina, small-pox, &c. Cases do sometimes appear apparently sporadic, just as the epidemics themselves are often apparently capricious; but these instances are so exceptional as to leave doubt of authenticity, and, under any circumstances, do not invalidate the rule. It is unnecessary to add, that affections of this form of epidemic rarely occur more than once in the same individual; or that one, if not two, of them may be induced artificially in a modified form, giving equal security against the spontaneous occurrence of the severe form or type of the natural disease. If the experience and knowledge, now ample, acquired relative to these facts by long study of them, as they occur in the human body, be transferred to observation of, and for comparison with, the various forms of disease occurring among the lower animals, they will be found equally applicable in many cases, and inferentially in all. As animals have a physiology in common with



the human race, so have they a pathology. The unity of design in structure and function is equally manifested in health and in disease. What is true of epidemics is, *mutatis mutandis*, equally true of epizootics; what of endemics, of enzootics. The diseases are not only closely allied, they are identical—" *Mutato nomine de te fabula narratur.*" All the fevers incidental to humanity are reproduced, not only in the equine and bovine, but in all other species brought under the same physical conditions. The discovery which perhaps most redounds to the credit of medicine as a science, or as the healing art, was in the linking together of separate orders of creation through the bond of disease. The same bovine herd which changes grass into flesh and milk for man's sustenance, also prepares an antidote to the direst ill that befalls his humanity. It will equally redound to its honour if our profession can find out a prophylactic, and pay back the boon, if not in kind, at least by intelligence, and rescue a race from a pest as dire to it as small-pox once was to us. Whether from motives of ideal gratitude to these bovine benefactors, or from veriest self-interest, an active spirit of inquiry is prompted which cannot let the secret which has so long baffled and eluded us lie much longer hidden. The similarity or identity of the disease of man and of animals is now so fully recognised, that to trace a new affinity is nothing very wonderful. If, however, it be useful in removing a source of error in diagnosis or practice, it will be none the less important. To trace the identity of pleuro-pneumonia and rubeola may be nothing remarkable, but exceedingly desirable to do in consequence of its probable practical utility. Both diseases are so prevalent, and so fully comprehended in many respects, that it may seem strange why the analogy should not have before been detected. Two circumstances seem to explain this oversight—1st, The obscurity of the first stage of pleuro-pneumonia as contrasted with the well-marked conditions of the second stage; 2d, The well-marked characters of the first stage of rubeola, and the comparative infrequency of the second stage. Remembering that it is by tracing the analogies of these stages respectively, and that the most prominent features are reversed in the two species of patients, it is easily understood how observation missed tracing the affinity. The symptoms of the first stage of rubeola in the human subject are familiar to all; but close watching is required to note the corresponding symptoms in the brute. The description given by systematic writers, and the observations which any one may make for himself, prove that these symptoms correspond in every particular. There is a period of incubation of variable length; the onset in both is by the shiver characteristic of approaching febrile disorder, which soon follows. In both, the symptoms are at first those common to other affections, and which at any other time than that of an epidemic or epizootic would hardly attract attention. In both it is, after some days of indefinite illness, that cough begins, as of a common cold, with coryza, puffy features, watering of the eyes, which are blood-shot; the mouth is clammy, and the secretions, as of milk, are diminished as the fever increases. The skin of the lower animal about this period becomes dry, and tightly bound down to the subcutaneous textures. It is not merely the staring coat usual in cattle in most illnesses; but it is a peculiar dry, hard, wiry state, and has been noticed by some to be so in blotches. This condition or symptom is noticed at the same period as would correspond to the appearance of the eruption in man. At this time red spots or patches may be often perceived on the mucous surfaces of the mouth and nostrils, as is not uncommonly witnessed in the rubeola; and an offensive odour comes from the mouth, precisely alike in both cases. The cutaneous rash has often been noticed, and it was at one time supposed to be a form of eczema, of which the pleuro-pneumonia was a sequela. At this earlier period of the fever, neither auscultation nor percussion is of much avail. By the former, the dry sonorous râle of ordinary bronchitis may be detected along the windpipe, and in the bronchial tubes. Every medical man knows how closely these agree as among the general symptoms of rubeola. I am aware that the distinctness of the eruption is not mentioned by several systematic writers, who seem to include it under the ordinary



account of the coat ; and if we bear in mind the thickness of this hairy covering, we readily understand how a mere efflorescence of the cutis passed unnoticed, for it is not like varicella, or variola, while in scarlatina the intense redness of the mouth and fauces could not fail to be seen, and to lead to the detection of the rash in that fever. But the strongest proof of the presence of an eruption is the copious furfuraceous or bran-like dust in the coat, owing to the desquamation of cuticle. In this the diseases strongly correspond. The state is not seen in every case, certainly, neither of rubeola nor of pleuro-pneumonia, because the rash must be very freely out in the first instance, or the noticeable desquamation does not take place. Again, the disease in animals is often very mild ; just as in cases of rubeola the symptoms may be so moderate as not to attract much notice. Some animals suffer very slightly ; and it is only when the disease runs on to the formidable second stage with severity that it arrests attention. Thus it was ascertained, by one inquiry in France, that 83 per cent. recovered, and 17 per cent. died, of all taken ill, and that of the former proportion some were very little affected. I cannot tell whether this bears any proportion to the mortality from rubeola, nor whether it corresponds to the fatality of pleuro-pneumonia in this colony ; but I may remark, that it proves that the latter disease is not always so terribly fatal in proportion to the number affected as is very generally believed ; and must also add, that neither is rubeola in the human subject the harmless, mild, safe malady it is often supposed, fit only to be treated by mothers and nurses.

In England 7000 people die on an average every year from it ; and in Victoria 250 died in 1861, and in 1860 as many as 250 died from it in Melbourne alone. What ratio these numbers bear to the numbers who suffered from the disease, it is quite impossible even to guess at ; but it proves a closer resemblance between the severity of rubeola in the human subject and the severity of the so-called pleuro-pneumonia in cattle than many might at first suspect. Thus far, then, for a hasty comparison of the two affections in the earlier stages, and the next thing to note is whether the parallel holds equally in the latter. Whatever may be thought as to the asserted correspondence of symptoms of the earlier period, those of the second are even more definite. The catarrhal affection is the most important, and always determines the prognosis. The most common cause of death in both is inflammation of some one or more of the pulmonary textures ; and when not fatal, both diseases leave chronic pulmonary mischief behind. In both, treatment is determined almost solely by the condition of the lungs, which, it is needless to repeat, is in both at first bronchitis, merging into vesicular and lobular pneumonia, and eventually pleuritis, with hydrothorax, and the usual exudations and results. The inflammation is apt to spread insidiously from the mucous surfaces of the air-passages to subjacent tissues, and after death, from rubeola, as from pleuro-pneumonia, portions of the lungs are hepatized in larger or smaller pieces. Although the pulmonary affection is that proper to both, yet the mucous surface of the bowels is apt to be also affected, and there is then a peculiarly foetid diarrhoea in either case in the later stages. The expectoration in both passes through similar changes during the progress of the disease, from thin whitish fluid to tenacious, viscid, muco-purulent matter. In comparing the *post-mortem* appearances, there is one remarkable point of resemblance, the more so as it differs from any appearance of the lungs in ordinary hepatization. In rubeola this hepatization is usually in distinctly separate portions, sometimes even in small patches, as if the inflammatory or congestive action had been limited to isolated lobules, or to clusters of lobules. At other times these small pieces may co-exist with the condensation of a large portion of one lung, or of a whole lobe. The condensed piece may even lie like a ball the size of the fist in the centre of an otherwise sound lung. In ordinary hepatization from active congestion, or sthenic inflammation, or even from the hypostatic inflammation in adynamic fever, the hepatization is more uniform, being deep-coloured and dense at the lower portions, lessening as it ascends to the upper. In rubeola and in pleuro-



pneumonia, it is quite different. The congestion, or condensation, whether it be from inflammatory action proper, or merely congestion *per se*, is patchy. A section of a lung, or lobe, shows this singularity, and partly gives rise to that marbled or mottled appearance so well known to those who have inspected them. It was not inaptly likened to a piece of brawn by one observer. To this aspect the interlobular areolar tissues, loaded with fibrin, and so rendered thicker, and in colour more yellowish and distinct from the red, or brown, or pink vesicular portions, contribute. As there may be co-existing all degrees of congestion, of inflammation, and of hepatization, so are there all shades of resulting colour, from reddish yellow to deep brown. But these colours never merge into one another; they are all bounded by the bands or septa alluded to. The grand thing to note in this parallel, is the isolated portions of the lungs thus separately congested in both diseases, evidently from the same form of morbid action going on during the progress of the disease. The exudation exudes in the same manner as in ordinary cases of inflammation. There are the processes of re-absorption of serum, and organisation of fibrin into false membranes, causing adhesions between the naturally free surfaces of the pleura. It is often correctly stated that adhesions rarely form in the exudation upon the pleura in pleuro-pneumonia, and in this character also the complaint agrees with rubeola. For this reason loose flocculi of lymph float in the fluid of the exudation. As other terminations or results of inflammation, there are gangrene and abscesses, according to the degree of intensity, of which pathologists do not require particular description. When an affected lung recovers tone, and is restored to healthy function, it is accomplished by the same reparative actions as are known to take place in the human body. In cattle, as in man, it often happens that there is neither death nor absolute recovery. The lungs remain permanently impaired; hectic supervenes, and long after the first attack may have been forgotten, the animal sinks under the inroads of consumption. In such cases it is occasionally spoken of by those who are observant and skilful, yet not pathologists, as a recurrence of the original disease lasting through many months—as a re-awakening up of the symptoms after they had been lying for a time dormant. But it would be just as correct to speak of a man's dying of rubeola, who sinks from phthisis, induced in a lung weakened by the sequelæ of a long previous attack. In both the disease attacks the fœtus *in utero*, and in both causes a tendency to abort. The excitement of an animal at the onset of pleuro-pneumonia, as shown by the proneness to rush, and other signs, is but a manifestation of delirium, such as always attends, more or less, the beginning of measles; while the arched back, tender spine, and heaving flanks of the later periods would not be so observable in measles, owing to the different posture of the patient. Thus we find that in every essential particular the signs are alike. To no other disease incident to man will this one correspond, while rubeola alone answers to the descriptions of pleuro-pneumonia among cattle. The two dovetail and fill a gap in the respective nosologies. There is another circumstance which seems something more than a coincidence, and contributes no small amount of corroborative evidence. It is this. The last epidemic of rubeola which visited this colony came simultaneously with the epizootic pleuro-pneumonia. In 1859–60 this happened, and rubeola, scarlatina, and diphtheria raged concurrently with the rapid spread of the formerly unheard of disease among cattle. If these affections of the human family have subsided—died out, as it were—it is because there are no more materials, no more subjects, no more pure blood left liable to their infection; and so will they slumber, apparently extinguished, until a fresh generation grow up in pristine susceptibility. In the same way will it be with pleuro-pneumonia, unless, which is at least as yet unproven, inoculation prove a perfect prophylactic. In this also is there, by the way, another point of affinity, for inoculation was long ago proposed and practised as a preventive of rubeola. Succeed or not, there is, however, no analogy between it and vaccination, for there are not, as in that case, two distinct species of animals to modify the virus, it being thus more

like small-pox inoculation, known to be so hurtful. Possibly, if the latter virus were diluted, as the lymph is in the other process, it might be less virulent locally, yet equally efficacious. The pathological principle, although not precisely Jennerian, may nevertheless be fundamentally the same, the virus repeating itself by catalysis; but upon such points much is as yet conjecture, as is the question of the suitability for human food of animals thus naturally or artificially infected. Those beasts would at least be most agreeable to think of for this purpose which suffered neither; and the hope of helping to get them yet all into this normal condition, has prompted this analogy, which, although it asserts no panacea, may, if confirmed, perhaps suggest what is far better—the means of absolute prevention, both of the typical disease and of its bovine analogue.

### OBSERVATIONS ON STERILITY IN MAN: WITH CASES.

By T. B. CURLING, F.R.S., Surgeon to the London Hospital, and Examiner in Surgery to the University of London.

(From the *British and Foreign Medico-Chirurgical Review*, April 1864.)

(Continued from p. 320.)

I FEEL no little hesitation in calling in question the claims to paternity in instances of this kind, but it is remarkable that as yet no case has been found in which a retained testicle has been fully proved to be capable of secreting a fertilising fluid. The observations collected in this paper seem sufficient to show that as a rule they do not; and although I see no valid reason why there should not be exceptions—and Mr Durham's case may possibly be one—still, the evidence is wanting to establish the exception in either of the instances of reputed paternity which I have mentioned. Dr Debrou (Orleans) relates the case of Lebert, a man aged forty-two, who died in the Hôtel Dieu, at Orleans, of strangulated hernia on the right side, after four days' illness. After death both of his testicles were found in the inguinal canals, the scrotum being wanting. The body in other respects was that of a robust, well-formed man. He had been married, and was said to have liked intercourse with his wife, who had borne him a son, then eight years of age. His testicles, which were normal in structure, were carefully examined by Gosselin and Godard separately. They were unable to discover spermatozoa in either of them;<sup>1</sup> Debrou adduces this case as an argument to show that the spermatozoa are not necessary to the fertility of the semen; but as their presence is admitted by the best physiologists to be essential, and as they are constantly found in the testicles of robust men, we may fairly conclude that the impregnation of the wife was most probably due to another source than the legitimate one.

It has been suggested that the testicles may secrete spermatozoa at one time and not at another, and that although they were not discovered in the foregoing cases, impregnation may have occurred at a period when the testicles were performing their functions properly. Numerous observations on the spermatic fluid by myself, Dr Davy, and others, have fully shown that in healthy adults the vesiculæ seminales and vasa deferentia almost invariably contain spermatozoa, whilst there is no evidence whatever to show that the testicles secrete a fluid at one time perfect, and at another time destitute of its essential element. There is no analogy to be found in the periodic intermissions in the sexual functions of the lower animals, since in them, when the secretion of the testicles is suspended, the power to copulate is also in abeyance.

As a malposed testicle does not secrete a fertilising fluid, we have a strong additional reason for promoting the passage of the gland into the scrotum; and

<sup>1</sup> Gazette Hebdomadaire de Médecine et de Chirurgie, t. viii. 1861.



in early life, when the testicle has emerged from the abdomen, much may be done by gentle manipulation to obtain this end.

It has not been ascertained satisfactorily why a retained testicle does not perform its secreting function. One cause, no doubt, is imperfect development; for, as I have already remarked, the misplaced glands are small in size, and frequently have not undergone the change which takes place at the approach of puberty. But in several instances mentioned by Godard, this must have occurred, for he states that the tubuli could be completely unravelled, which is not the case in an undeveloped gland.<sup>1</sup>

2. *Sterility from Obstructions in the Excretory Ducts of the Testicle.*—In 1853, Mr Gosselin made known some curious researches in relation to this subject. He carefully examined the semen in twenty men who had been attacked with double epidydidimitis after gonorrhœa. In fifteen of these cases which were comparatively recent, a callosity existed in the tail of the epididymis at the time they seemed to be cured. In all, the genital functions appeared fully restored and the sperm normal. The semen was repeatedly examined at intervals of several weeks, but no spermatozoa were detected. M. Gosselin lost sight of all but two cases, and in these the return of spermatozoa in the semen occurred after some months, and coincidently with the complete disappearance of the induration in the epididymis on one side. In the remaining five of the twenty cases the double epididymis had occurred several years previously. One man, aged forty-five, had been attacked twenty years before, but the left callosity no longer existed, and spermatozoa were found in the semen. In another man the disease dated back five years, and had left a considerable induration at the lower part of each epididymis. The general health was good. No spermatozoa could be detected. In the three other cases the disease had occurred ten, or six years before. There was hardness on both sides. The testicles were otherwise unaltered. The indications of virility were quite satisfactory, and the semen presented its usual appearance. The individuals had all been married several years, but had no children. The sperm was carefully examined, and found destitute of spermatozoa. One of them had had children by a former wife before the attack of double epididymitis.<sup>2</sup> Since the publication of the preceding observations, M. Gosselin has met with two cases of men who, after suffering from bilateral epididymitis during their youth, had retained an induration on each side. They had been married several years and had no children. In both the virile powers were not, apparently, weak, but the sperm was entirely wanting in spermatozoa.<sup>3</sup>

The following cases which have occurred in my practice, show the importance of these inquiries.

CASE V.—A stout, well-built man, aged forty-two, a widower, desired to obtain my opinion on the propriety of marriage. In early life he had indulged freely in sexual intercourse, and at the age of twenty-eight contracted a gonorrhœa, which was followed by double orchitis. This did not cause any loss of power, and at the age of thirty he married a young healthy woman. His wife had no children, and died ten years after the marriage. He then formed an

<sup>1</sup> With the view of ascertaining what influence simple position might have on the functions of the testicle, I commenced some experiments on animals. It is well known that in certain rodents the testicles remain in the abdomen until the season of heat, when they descend into the scrotum and secrete semen. My experiments on the adult guinea-pig did not answer, for the domestic animal was always in heat. I attempted to close the abdominal ring of the young animal with sutures, in order to prevent the testicle escaping at all from the abdomen, but the parts were so fragile and delicate, that the sutures soon came out, and the object was not attained. I refer to these experiments, because they indicate a course of inquiry which might still be followed out with advantage.

<sup>2</sup> Archives Générales, 5<sup>e</sup> série, t. 11.

<sup>3</sup> Note to the French translation, by M. Gosselin, of my work on Diseases of the Testis, p. 288.



illegitimate connection with a young woman who had previously borne a child, but his acquaintance with her did not lead to her becoming pregnant. He stated that his sexual power had declined slightly within the last two years, but he was quite efficient. He had repeatedly experienced uneasiness in the testicles the day after sexual intercourse. The question submitted to me was his ability to procreate children, as he contemplated a second marriage in the event of a decision in the affirmative. I found the right testicle of fair size, the left somewhat small, and both rather flaccid. In the lower part of the epididymis of each testicle there was a firm induration a little tender on pressure. Some discharge emitted in sexual intercourse was brought to me for examination. It was whitish, turbid, and glutinous. There was no trace of spermatozoa or spermatic granules. I gave my opinion, that in the event of marriage his wife would be barren.

CASE VI.—In 1860, a strongly-built man, aged forty-four, who had just arrived from a distant colony, consulted me in the following difficulty:—Twelve years ago he married a healthy young woman; who bore him a child, now eleven years of age. Two years after marriage he got a chill after a long fatiguing ride in wet boots. He was seized with pain in the loins and bladder, had turbid urine and an urethral discharge, and was afterwards attacked with double orchitis. He became weak and emaciated, and was laid up five or six weeks. On recovery from this illness he found his sexual powers diminished, but he stated that they were still strong, and he was capable of indulging two or three times a week. His wife, however, had not conceived again. She was dissatisfied, desiring to increase her family, and believed he was at fault. It was arranged between them that he should seek advice in the mother country, and in the event of his returning without the ability to beget children, that they should separate. His testicles were rather small and flaccid. At the lower part of the epididymis of each gland, there was a distinct induration, and the swellings were morbidly sensitive. The fluid emitted during erotic dreams was examined on two occasions. It was thin, and entirely wanting in spermatozoa. After experiencing sexual desires he had uneasiness in the testicles. I gave the opinion that he was incapable of procreation; but I also ventured to intimate that, however great might be the desire for children, sterility acquired after marriage was not a sufficient ground to justify a separation, especially as he was able to gratify his wife, though not to make her a mother. He gave me to understand, notwithstanding, that the arrangement would be carried out.

CASE VII.—A medical gentleman of my acquaintance, aged forty-five, moderately robust, contracted syphilis twenty-five years ago, and the next year had an attack of acute orchitis on the left side. This was followed by complete atrophy of the testicle, the organ being reduced to about the size of a French bean. He suffered at the same time from epididymitis on the right side. Slight secondary symptoms occurred during nearly ten years, but since then there has been no trace of the disease. He married thirteen years ago. His right testicle is of fair size, but there is decided enlargement and induration of the epididymis. He has never been deficient in virile power, and the emissions have been abundant. His wife has never become pregnant. Between three and four years ago, he had occasion to examine the urine of a patient containing spermatozoa, and for the sake of comparison placed some of his own semen in the microscope. He was surprised to find it entirely destitute of spermatozoa. Since then he has frequently searched for them in the fluid emitted in sexual intercourse, but had never succeeded in finding any.

CASE VIII.—In 1858, a gentleman, thirty-eight years of age, consulted me under the following circumstances:—He stated that, in India ten years before, after excitement from drink and excessive indulgence in sexual intercourse, he was attacked with violent inflammation of the prostate or parts around. He was obliged to embark for England, and was unable to obtain advice on board the ship. An abscess formed and burst in three situations—into the rectum, into the urethra, and in the perinæum. After his return to England, an elastic



catheter was retained in his bladder for the cure of the urinary sinuses. This caused inflammation of both testicles. He discontinued the instrument and went to the sea-side, where, after many months, the sinuses closed, but he has since been subject to a mucous discharge in his urine. His health was good, and he was robust and active. Seven years ago he married, but his wife had never become pregnant. His desires were strong and his powers sufficient. In intercourse no distinct emission took place. He had the sensation of ejaculation with uneasiness at the neck of the bladder, but no discharge followed. His urine had been repeatedly examined after coition, but no spermatozoa had been discovered in it. He had no stricture nor enlargement of the prostate. There was a distinct induration in the lower part of the right epididymis. The testicles were, in other respects, sound and of fair size. The absence of emission led me to conclude that the inflammation and abscess had caused an obstruction in the ejaculatory canals. I recommended a prolonged course of the iodide of potassium, and the application of tincture of iodine to the perinæum, without any sanguine hope of absorption of the supposed source of obstruction after so long an existence. No change ensued. In March 1863, this gentleman, for the first time, called my attention to a small tumour, about the size of a large pea, in the vas deferens, about an inch and a half above the left testicle, which, it was supposed, might obstruct the passage of semen. Being very anxious to acquire the power to impregnate, he requested me to remove the tumour. Though not anticipating a satisfactory result, I consented to perform this slight operation, April 4th. Sensibility having been annihilated by a freezing mixture, and the vas deferens fixed by a clamp, I cut upon the duct, and avoiding the veins around, opened it just below the tumour, and introducing a fine probe, found the canal completely obstructed by the swelling. It consisted of a cyst containing a soft whitish substance like sebaceous matter. This was removed, and an opening made into the duct both above and below. The small wound in the scrotum was closed with a single suture. Matters went on very well for three days, when gout attacked one foot, and was shortly followed by orchitis on the left side, with considerable swelling and thickening of the spermatic cord. Under purgative treatment with colchicum the gout subsided, but the orchitis proved indolent. The patient's general health was a good deal disordered. Suppuration occurred in the spermatic cord, and the part did not heal for three weeks. There has been no restoration of the passage for the semen.

M. Godard has recorded an interesting case (Case V. in Table I.) of a strong, vigorous man who had the left testicle in the groin, and the right one, of full size, in the scrotum. When young he was much addicted to women, and became the father of a child. At the age of twenty-one the testicle in the scrotum was attacked with gonorrhœal orchitis, which became chronic, and left a deposit in the tail of the epididymis. This was followed after five years by stricture in the urethra, and a second attack of orchitis in the right testicle. At the age of thirty-three he married, but his wife never became pregnant. She died at the end of five years, and at the age of thirty-nine he married again, but had no children. The ejaculated sperm was examined by M. Godard and others, but no spermatozoa could be detected in it. This is a case of sterility arising from a double cause—from malposition of one testicle, and obstruction in the excretory duct of the other.

The preceding observations show that epididymitis, especially when double, should not be regarded as a trivial and unimportant affection, and that the treatment of it should be prolonged until the effused matter is absorbed and all induration has disappeared, for if the disease be allowed to pass into and remain in a chronic state, permanent obstruction of the excretory duct is liable to ensue. It has been found that under careful treatment callosities obstructing the canal have disappeared at the end of many months, leaving the course of the semen free. M. Godard has related a case in which he had cured sterility from this cause that had lasted eighteen months.

The passage of the semen from the testicle may be prevented by congenital



absence of the vas deferens. M. Gosselin examined the sexual organs removed from a man about twenty years of age. The funicular and inguinal portion of the vas deferens was wanting on the right side. The right testicle was healthy, but the ducts of the epididymis were gorged with yellow fluid, which contained a quantity of dead spermatozoa. The testicle, vas deferens and vesiculæ seminales on the left side were normal, and contained abundance of spermatozoa. There were none in the right vesicula. John Hunter, in dissecting a male subject, found the vasa deferentia wanting on both sides. The testicles which were in the scrotum were sound and of good size. There are other instances on record of a double imperfection of this kind, the testicles being sound. In such a case the man would of course be sterile. Many years ago I made experiments on animals which were confirmatory of the observation, that the testicles may be properly developed, though a physical obstacle to the elimination of their secretion is present from birth; and that so long as these organs exist entire, the individual acquires and preserves all the marks of the male sex.<sup>1</sup>

The excretory duct of the testicle is liable also to be interrupted by tubercular deposits in the epididymis. It is well ascertained that this part is much more frequently the seat of tubercle than the body of the gland, and is often extensively diseased whilst the substance of the testicle remains sound.

CASE IX.—A young man, aged twenty-eight, moderately robust, was under my care on account of large tubercular deposits in the epididymis of both testicles. Although the disease had existed seven years, and had softened down and suppurated, there was not the slightest indication of morbid change in the substance of the glands, which were of moderate size. His general health was good, and he had no symptom of tubercular disease elsewhere. He had fair sexual powers, but the emitted fluid was small in quantity, and contained no spermatozoa.

This cause of sterility did not escape the searching inquiries of M. Godard. In a letter written to me in November 1860, he remarks, “J’ai toujours constaté que les individus avec double affection tuberculeuse du testicule entraient en erection, pouvaient avoir des rapports sexuels, mais éjaculaient au plus une à deux gouttes de semence absolument privée de spermatozoïds.”

The capacity for sexual intercourse may exist, though in diminished force, in extensive chronic disease of both testicles when the secreting structure is almost entirely destroyed, such as in old-standing strumous orchitis. This will not appear remarkable, when it is recollected that coition may be performed for a time even after double castration.

CASE X.—A gentleman, aged thirty-two, of robust frame, married, and the father of two children, came under my care on account of strumous orchitis, producing great enlargement of the right testicle. His left testicle had been excised for a similar affection seven years before. He still continued sexual indulgence. The disease having resisted all remedies, I removed the remaining testicle. On examination I could find no trace of tubular structure, the enlarged organ consisting of a mass of lymph, with scrofulous pus in the centre. There were no spermatozoa in the epididymis and vas deferens. He had intercourse with his wife a week only before the operation.

3. *Sterility from Impediments to the Escape of the Seminal Fluid.*—It is well known that a close stricture in the urethra so completely interrupts the passage of the seminal fluid, that in ejaculation it regurgitates into the bladder, where it mixes with the urine. In erection of the penis the urethra becomes narrowed, so that a stricture which offers but a slight obstacle to the flow of urine may under congestion be sufficient to impede the emission of semen. I have grounds for concluding that sterility from chronic stricture in the urethra exists to a greater extent than is commonly supposed, being in some instances little suspected by the patient himself. The semen not having been ejected, dribbles afterwards from the patient as erection subsides, and so misleads the

<sup>1</sup> Treatise on Diseases of the Testis, first edit., p. 63.



patient. As this is a condition which is in most cases remedial by the cure of the stricture, it is unnecessary to say more than to call particular attention to it as not an uncommon source of infertility. In describing Case VIII., I have mentioned that the absence of emissions in copulation led me to conclude that inflammation and abscesses near the prostate gland had occasioned obliteration of the ejaculatory canals, so that there was apparently a double cause for sterility, the excretory ducts also being obstructed. But sterility originating in a closure of the ejaculatory canals is a subject which needs further investigation. They must be liable to injury in lithotomy, and sterility might be the result of a bilateral operation.

Accoucheur physicians have informed me that, in seeking for the cause of sterility in their married patients, they have observed an absence of spermatozoa in the fluid removed from the vagina after sexual intercourse, and they have ascertained that the true cause of barrenness has in many instances rested with the husband. It is supposed that in men exhausted by early excesses the testicles do not secrete the emitted fluid, consisting of the secretions of the vesiculæ and prostate. No doubt this is sometimes the case, for in several weak patients I have detected an absence of spermatozoa. In advancing atrophy of the testicles, before the capacity for intercourse is wholly lost, the glands cease to supply the essential element.

CASE XI.—A gentleman, aged forty-seven, a married man of robust appearance, consulted me on account of both testicles, with failure in sexual power. The wasting had been going on gradually for eighteen months. It commenced during a voyage at sea, when he was separated from his wife. I found the testicles soft, and reduced to one-fourth their natural size. They were extremely sensitive. He still enjoyed connection, but at long intervals. On examination of the fluid removed from the urethra shortly after intercourse, I could find no trace of spermatozoa.

But when the desire and capacity for intercourse are strong, I believe that spermatozoa are never absent from the ejaculated fluid, except from causes which I have described in this communication. When the ventricles cease to secrete them, there is defective power of copulation, and the absence of spermatozoa is an indication of incompetency for marital duties.

Two important and delicate questions arise out of these inquiries: 1. Whether a man who has the inclination and power to copulate, but who is nevertheless sterile, is justified in contracting marriage—should such a person be condemned to celibacy? 2. Whether this condition is a sufficient ground for divorce?

1. That a man who is unable to fulfil the command “to be fruitful and multiply” is right in disappointing the hopes and perilling the happiness, and perhaps even the health, of a woman, cannot, I think, be maintained by any casuist, and in some of the foregoing cases I have felt it my duty to give advice in accordance with this opinion.

It cannot be doubted that in women ready for conception, frequent sexual excitement without impregnation is very likely to prove injurious to health. Dr West mentions the occurrence of chronic ovarian irritation and chronic congestion of the womb, leading to hypertrophy of the uterine substance and profuse bleeding from its lining membrane, in cases where marriage is sterile.<sup>1</sup> It has been supposed that more important diseases of the female sexual organs, of a chronic character, have owed their origin to irregular and unfruitful excitement. In Case VII., the sterile patient, a medical gentleman, informed me that after six months of married life his wife suffered from some of those obscure symptoms of irritable cervix uteri called chronic inflammation, and he believes that

---

<sup>1</sup> Diseases of Women, Part I. p. 55. Dr Priestly remarks:—“It is highly probable that sexual excitement that is not followed by the occurrence of pregnancy leads in many cases to permanent congestion of the ovaries, and this may readily be lighted up into more active diseases.”—(Clinical Lecture on Menorrhagia, *Medical Times and Gazette*, vol. i. 1863, p. 445.)

his wife's troubles were caused by non-impregnation. I know also that the wife of another patient, whose case is described in this paper, a fine healthy woman before marriage, has since been constantly under the care of accoucheur physicians.

2. The second question is one upon which a surgeon is scarcely called upon to pronounce an opinion. But I may venture to remark, that as sterility in women is not considered an adequate cause for divorce, so the man ought not to pay such a penalty for unsuspected unfruitfulness.

---

## ON THE CHEMISTRY OF THE FEEDING OF ANIMALS FOR THE PRODUCTION OF MEAT AND MANURE.

BEING A LECTURE DELIVERED BEFORE THE DUBLIN SOCIETY, March 31, 1864.

By JOHN BENNET LAWES, F.R.S., F.C.S.

THE breeding and feeding of stock must always constitute an important branch of the agricultural practice of this Island. With a climate rarely so hot and dry in summer, or cold in winter, as to materially arrest vegetation, Ireland may not less truly than poetically be styled the Emerald Isle. A succession of seasons more than usually unfavourable for grain crops has greatly reduced the profits, and even the capital, of many of your farmers. It is natural, therefore, that there should be, at the present time, more attention directed to the production of meat, and less to the growth of corn; more especially as with the declining price of grain that of meat has considerably advanced, and has probably not yet reached its highest point.

Although the application of science to agriculture is not generally regarded with much favour by practical farmers, there are still very many who feel how advantageous it would be to know more of the rationale of their operations than they do at present. The scientific principles involved even in old-established practices are frequently but little understood; whilst farming is every year becoming less and less of a mere routine business than it was formerly: new foods, new manures, improved descriptions of stock and seed, and new mechanical appliances are constantly being introduced, requiring more knowledge and discrimination in their selection and use.

The particular branch of agriculture upon which I have the honour to address you this evening is that of the production of *meat* and *manure*.

We all know that when fattening animals are supplied with a sufficient amount of proper food they increase in weight, a portion of the food being fixed or stored up in the body; that other portions are rejected by the animal in the liquid and solid form, and serve as manure; and that others are expended or lost in the processes of respiration and cutaneous exhalation. Experience also teaches us that some foods have higher feeding values than others, and it is generally supposed that with a difference in feeding properties there will also be a difference in the value of the manure.

It is the province of agricultural chemistry to determine what proportion of the several constituents of the food consumed will be stored up in the form of meat, and how much will remain as manure, according to the description of animal, and the kind of food employed; and so to provide the means of estimating the value of the respective products of the feeding operation. To this end, it is necessary to determine, by means of careful analysis, the composition of the food consumed, of animals in the store or lean and in the fat condition, and of the manurial matters voided. Such an undertaking is, however, by no means a right one, and it can only be carried out with any prospect of success by the conjoint aid of experiments on a large scale in the feeding-shed, and of investigations in laboratory, involving a great amount of analytical labour, and requiring the observance of all the refinements of method which modern science permits.



I propose to bring before you a condensed summary of some of the results which have been obtained in experiments made at different times during the last twenty years, at my farm and laboratory, at Rothamsted, in Hertfordshire. There are, it is true, many points which are not as yet satisfactorily cleared up, and some of these are still under investigation. The figures given in the tables, in most cases, however, represent the results obtained in careful experiments with large numbers of animals of each of the descriptions indicated, and they may be taken as showing what should be the average result obtained in ordinary farm practice, when animals of fair quality are fed liberally for the butcher.

#### COMPOSITION OF OXEN, SHEEP, AND PIGS, IN THE STORE AND FAT CONDITION.

For the purposes of my illustration, I shall assume that an ox or a sheep will increase in weight by about one-half, and that a pig will double its weight during the so-called fattening period. Accordingly, I shall direct your attention to the composition of each of these descriptions of animal when in the lean or store, and also when in the fat condition, after it has increased in the proportion above supposed. I shall then show the average amount of food required to produce 100 lbs. increase in live weight, and also the composition of the food, of the increase, and to some extent of the manure also; and in doing so I shall assume that the animals are liberally supplied with good fattening food; for, it should be borne in mind that, as a large amount of the food is expended to maintain the respiration of the animals, the proportion of this expenditure or loss to the amount of saleable increase obtained will be the greater the longer the period required for the production of the increase, and hence it will be the greater if the food be inferior in quality, or stinted in amount.

With these preliminary remarks, I will now direct your attention to the tables.

TABLE I.—*Composition, per Cent., of Oxen, Sheep, and Pigs, in the Store, and in the Fat Condition.*

	Oxen.		Sheep.		Pigs.	
	Store.	Fat.	Store.	Fat.	Store.	Fat.
Nitrogenous Substance, . . . .	18·0	15·0	15·0	12·5	14·0	10·5
Non-Nitrogenous Substance (Fat),	16·0	30·0	18·0	33·0	22·0	44·0
Mineral Matter, . . . . .	5·2	4·0	3·5	3·0	2·8	1·8
Total Dry Substance, . . . .	39·2	49·0	36·5	48·5	38·8	56·3
Water, . . . . .	60·8	51·0	63·5	51·5	61·2	43·7
Total, . . . .	100·0	100·0	100·0	100·0	100·0	100·0

Table I. shows the composition, per cent., of oxen, sheep, and pigs, both in the store and in the fat condition, the constituents given being the nitrogenous substance (lean), the non-nitrogenous substance, or fat, the mineral or combustible matter the sum of these or total dry substance, and the water.

Taking first the nitrogenous substance, it is seen that in each description of animal there are several per cent. less of it in the fat than in the store condition. Of fat, on the other hand, there is in the case of both the oxen and the sheep nearly, and in that of pigs fully, twice as much in 100 lbs. live weight of the fat, as in the same weight of the store animals. The mineral matter, again, like the nitrogenous substance, is found in less proportion in the fat than in the store animal. Lastly, the proportion of total dry substance is seen to be con-

siderably increased, and that of the water diminished, as the animal passes from the lean to the fat condition.

In fact, the fattening process may be said to consist mainly in the diminution of the proportion of water, and the increase of that of fat. The actual amounts of both the nitrogenous and the mineral matter do, indeed, augment during the fattening process, as will be seen presently, when I come to speak more directly of the composition of the increase itself; but as they do so in so much less proportion than the fat, it results that their proportion in a given live weight becomes less and less, whilst that of the fat increases as the animal matures.

The quality of the meat depends, however, much upon the distribution and the character of the fat deposited as well as upon its amount. Different breeds store up their fat very differently—some more outside upon the carcass, some more around the internal organs, some in more intimate mixture with the nitrogenous or fleshy portion of the meat, and so on. Then, again, complaints are sometimes heard of the fat, particularly of pork, boiling away. Such faulty deposition is generally attributable to the character of the food, and is found to result when too much oily matter is given, or when pigs are fed freely with roots or other succulent food.

PROPORTION OF PARTS, IN ANIMALS OF DIFFERENT DESCRIPTIONS,  
AND IN DIFFERENT CONDITIONS OF MATURITY.

Passing from the question of the chemical composition of oxen, sheep, and pigs, it will be desirable, before considering the relation of the increase and manure produced to that of the food consumed, briefly to point out some characteristic differences of structure or relative proportion of certain of their internal organs, as in these will be found the key to the difference in the character and amount of food which the three descriptions of animal respectively require. Table II. illustrates this part of the subject.

TABLE II.—*Relation of Parts in Animals of different Descriptions, and in different Conditions of Maturity.*

	Per Cent.					
	In different Animals.			In Sheep in different Conditions.		
	Oxen.	Sheep.	Pigs.	Store.	Fat.	Very Fat.
Average of	16	249	59	5	100	45
Stomachs and Contents, . . .	11·6	7·5	1·3	9·1	7·0	5·6
Intestines and Contents, . . .	2·7	3·6	6·2	5·3	3·8	2·8
Internal Loose Fat, . . . . Heart, Aorta, Lungs, Wind- pipe, Liver, Gall-Bladder and Contents, Pancreas, Spleen, and Blood, . . . } Other Offal Parts, . . . .	14·3	11·1	7·5	14·4	10·8	8·4
	4·6	6·9	1·6	4·5	6·0	7·5
	7·0	7·3	6·6	8·4	7·7	6·5
	13·0	15·0	1·0	17·9	16·1	13·1
Total Offal Parts, . . . .	38·9	40·3	16·7	45·2	40·6	35·5
Carcass, . . . . .	59·3	59·2	82·6	53·4	58·7	64·1
Loss by Evaporation, &c., .	1·8	0·5	0·7	1·4	0·7	0·4
Total, . . . .	100·0	100·0	100·0	100·0	100·0	100·0



It is seen that whilst 100 lbs. live weight of the ox comprises about  $11\frac{1}{2}$  lbs. of stomach and contents, that of the sheep contains only  $7\frac{1}{2}$ , and that of the pig only  $1\frac{1}{3}$  lbs. Of intestines and contents, on the other hand, the ox contains only  $2\frac{3}{4}$ , the sheep  $3\frac{1}{2}$ , and the pig  $6\frac{1}{4}$  per cent. Again, of stomachs and intestines (and their respective contents) taken together, the ox contains about  $14\frac{1}{4}$ , sheep about 11, and pigs  $7\frac{1}{2}$  per cent. Thus, of the receptacles and first laboratories of the food, the oxen contain by far the largest, and pigs by far the smallest proportion, which would appear to indicate a great difference in the requirement for bulk of food, such, indeed, as we know in reality exists. Oxen require a larger proportion of woody fibre in their food than sheep, and sheep much more than pigs. On the other hand, the food of the pig contains much more starch, or allied digestible matter, than that of sheep, and that of sheep more than that of oxen, reckoned in relation to the weight of the animal; and it is known that starch undergoes its primary change (into sugar) almost throughout the length of the intestinal canal. Accordingly, we observe that the pig has a larger proportion of intestines than the sheep, and the sheep more than the ox.

Of the further elaborating, or what we may call the skilled labour organs of the body, and their fluids—the heart, liver, lungs, blood, &c.—the proportion is seen to be nearly the same in the three descriptions of animal.

The proportion of internal or loose fat is greater in the sheep than in the oxen; but it should be observed that a large proportion of the sheep contributing to the average result given in the table were in a more advanced state of fatness than the oxen. The comparatively small proportion of internal fat in the pig is accounted for by the peculiarities of the animal. The proportion of its internal organs is comparatively small, and its speciality is to lay on fat in a greater proportion outside the frame.

The second portion of the table shows the varying proportion of the different parts in one and the same description of animal, according to its degree of maturity. The animals selected for illustration of this point are sheep. Records not given in the table show that, as the animals grew and fattened, the actual amount, per head, of stomachs and contents increased considerably; that the intestines and contents did so in a much less degree; that the internal loose fat was more than trebled; and that the other internal parts, and their fluids, collectively, increased in nearly the same proportion as the stomachs and contents. The general result was, that the total offal parts increased in actual amount from the store to the very fat condition in the proportion of about 1 to  $1\frac{3}{4}$ ; but the total carcass parts augmented from 1 to nearly  $2\frac{1}{2}$ —much more, therefore, than the total offal parts.

Turning now to the figures in the table, it is seen that the per cent. or proportion in 100 parts, of all the internal organs and parts, excepting the loose fat, diminished very considerably as the animals matured and fattened. Whilst the total offal parts diminished from 45.2 in the store, to 40.6 in the fat, and to 35.5 per cent. in the very fat condition, the carcass parts increased from 53.4 in the store, to 58.7 in the fat, and to 64.1 per cent. in the very fat condition. That is to say, the so-called offal parts, which are chiefly composed of the organs of reception, elaboration, and transmission of the food constituents, increase in very much less proportion than those parts which it is the object of the feeder should be produced from the food consumed.

#### RELATION OF THE INCREASE, MANURE, AND LOSS BY RESPIRATION, TO THE FOOD CONSUMED, BY DIFFERENT ANIMALS.

We now come to the question of the description and amount of food consumed by the different animals to produce a given amount of increase, and to the collateral questions of the relation of the constituents in the increase and in the manure to those in the food consumed.

Table III. shows the amounts of certain foods assumed to be required for the production of 100 lbs. of increase in live weight—of oxen, sheep, and pigs, respectively. The amounts will, of course, vary, according to the quality of the

animal, the stage of its development, the external conditions to which it is subjected, the description and quality of the food, and so on; but the quantities assumed are approximately those which will be required, taking the average of large numbers of animals over the whole period of fattening, and supposing foods of the descriptions indicated, and of good quality, are employed, and that other conditions are moderately favourable.

TABLE III.—Food, Increase, Manure, &c., of Fattening Animals.

OXEN.

	250 lbs. Oil-cake 600 lbs. Clover Chaff 3,500 lbs. Swedes 4,350 } Produce 100 lbs. Increase, and Supply—				100 Total Dry Substance of Food Supply—			Amount of each Con- stituent stored up, for 100 of it con- sumed.
	In Food.	In 100 lbs. Increase	In Manure.	To Respira- tion, &c.	In Increase	In Manure.	To Respi a- tion, &c.	
Nitrogenous Substance,	lbs. 218	lbs. 9.0	lbs. 323.0	lbs. 636	{ 0.8	} 29.1	57.3	{ 4.1
Non-Nitrogenous Substance, . }	808	58.0	81.4	—	{ 5.2			
Mineral Matter, . . }	83	1.6			0.2	7.4	—	
Total Dry Substance,	1109	68.6	404.4	636	6.2	36.5	57.3	

1109  
SHEEP.

	250 lbs. Oil-cake 300 lbs. Clover Chaff 4,000 lbs. Swedes 4,550 } Produce 100 lbs. Increase, and Supply—				100 Total Dry Substance of Food Supply—			Amount of each Con- stituent stored up, for 100 of it con- sumed.
	In Food.	In 100 lbs. Increase	In Manure.	To Respira- tion, &c.	In Increase	In Manure.	To Respira- tion, &c.	
Nitrogenous Substance,	lbs. 177	lbs. 7.5	lbs. 229	lbs. 548.5	{ 0.8	} 25.1	60.1	{ 4.2
Non-Nitrogenous Substance, . }	671	63.0	62	—	{ 7.0			
Mineral Matter, . . }	64	2.0			0.2	6.8	—	
Total Dry Substance,	912	72.5	291	548.5	8.0	31.9	60.1	

912  
PIGS.

	500 lbs. Barley Meal produce 100 lbs. Increase, and Supply—				100 Total Dry Substance of Food Supply—			Amount of each Constituent stored up, for 100 of it consumed.
	In Food.	In 100 lbs. Increase	In Manure.	To Respira- tion, &c.	In Increase	In Manure.	To Respira- tion, &c.	
Nitrogenous Substance,	lbs. 52	lbs. 7.0	lbs. 59.8	lbs. 276.2	{ 1.7	} 14.3	65.7	{ 13.5
Non-Nitrogenous Substance, . }	357	66.0	10.2	—	{ 15.7			
Mineral Matter, . . }	11	0.8			0.2	2.4	—	
Total Dry Substance,	420	73.8	70.0	276.2	17.6	16.7	65.7	

420



The quantities of the different foods recorded in the table have been adopted after a very careful consideration of the results of numerous experiments on feeding on the large scale ; and after the illustrations which have been given of the different proportions of the organs in the different descriptions of animal it will be seen how consistent are the variations in the quantity and quality of the food recorded as required by the different animals. Thus, to produce the same amount of increase, oxen consume a much larger proportion of hay, containing so much indigestible matter, than sheep ; whilst pigs are fattened on a diet as concentrated and containing as little indigestible substance as corn alone. The actual amounts of food assumed to be required for the production of 100 lbs. increase in live weight are—for oxen, 250 lbs. of oil-cake, 600 lbs. of hay-chaff, and 3,500 lbs. of swedes ; for sheep, 250 lbs. of oil-cake, 300 lbs. of hay-chaff, and 4000 lbs. of swedes ; and for pigs, 500 lbs. of barley meal.

It will be remembered that when speaking of the composition of the animals themselves, their constituents were grouped under the heads of nitrogenous substance, non-nitrogenous substance, mineral matter, and total dry substance, and the same classification is, for convenience of comparison, adopted in reference to the composition of the food, increase, and manure, of the different animals is recorded in Table III.

As the food of the pig is the most simple, I will direct your attention to the figures relating to it in the first place. These will be found in the lowest division of the table.

The 500 lbs. of barley meal consumed in increasing the weight of the pig from 100 to 200 lbs. contains 420 lbs. of dry substance, and the 100 lbs. increase in live weight produced by it not quite 74 lbs. ; about 70 lbs. remain the manure, and 276 out of the 420 lbs. consumed are expended in respiration, and other exhalations from the body. Nearly two-thirds of the whole dry substance consumed have, therefore, been expended in keeping in working order the living meat and manure-making machine.

Looking to the column showing the composition of 100 lbs. of increase, it is seen that it contains only 7 lbs. of nitrogenous substance, and 66 lbs. , or more than nine times as much non-nitrogenous substance or fat, whilst the mineral matter does not amount to one per cent. The general result is, then, that nearly two-thirds of the fattening increase in live weight were pure fat itself, and only about one-fourteenth of it nitrogenous substance or lean meat.

But to produce the 7 lbs. of nitrogenous substance in increase, 52 lbs. were consumed in food ; by far the greater part of the remainder being found in the manure. To produce the 66 lbs. of fat, 357 lbs. of non-nitrogenous substance were consumed ; but as it existed in the food almost entirely in the form of starch, and as it requires about  $2\frac{1}{2}$  parts of starch to form one of fat, it may be said that at least 165 lbs. of the non-nitrogenous substance consumed contributed pretty directly to the formation of the 66 lbs. of fat. Lastly, in reference to the increase : of the 11 lbs. of mineral matter consumed, only about  $\frac{3}{4}$  lb. were stored up in the increase of the animal.

It is observed then, that a comparatively small proportion of either the nitrogenous substance, or the mineral matter of the food, is retained in the increase ; the manure, on the other hand, retains a very large proportion of the former, and nearly the whole of the latter.

Of 100 parts of gross dry substance consumed, 1·7 parts of nitrogenous substance, 15·7 of fat, and 0·2 of mineral matter—in all 17·6 parts—are stored up in the increase ; 14·3 parts, consisting of highly nitrogenous organic matter, and 2·4 parts of mineral matter, making a total of 16·7 parts, are retained in the manure ; and 65·7 parts, consisting chiefly of carbon, hydrogen, and oxygen, are lost by respiration, &c. Or, if we reckon the proportion of each class of constituents consumed, which is stored up in the increase, the last column of the table shows that of 100 of nitrogenous substance consumed, 13·5 parts ; of 100 non-nitrogenous substance consumed, 18·5 parts ; and of 100 mineral matter consumed, 7·3 parts are retained in the increase.



It will not be necessary to follow so closely the figures in the table relating to the sheep and oxen. It will suffice to direct attention to the chief differences of result obtained with the three descriptions of animal.

Whilst the pig required only 420 lbs., the sheep required 912 lbs., and the oxen 1,109 lbs. of dry substance in food to produce 100 lbs. increase in live weight. In other words, the sheep consumed more than twice as much, and the oxen more than two and a half times as much, to produce a given amount of increase, as the pig. But the food of the pig was of a much higher character than that of the other animals. Whilst it consisted entirely of highly elaborated grain, closely resembling human food, the food of the other animals contained a large amount both of woody fibre and of crude succulent roots; that of the ox containing the largest proportion of hay, with its high percentage of indigestible woody matter.

Turning to the columns giving the composition of 100 parts of the increase, they show that whilst that of the pig contained 73·8 parts of dry substance, that of the sheep contained rather less, and that of the oxen rather less still. The proportion of fat also was greater in the increase of the pig than in that of sheep, and greater in that of sheep than in that of the oxen. The contrary was, however, the case with the proportion of nitrogenous substance, which was the greatest (9 per cent.) in the increase of the oxen, less (7·5 per cent.) in that of sheep, and less still (7 per cent.) in that of pigs. It will be observed, too, that the percentage of mineral matter in the increase of the ox and sheep is considerably higher than in that of the pig; and it is even rather higher in the case of sheep than oxen. Independently of any essential differences of structure in the different animals, this result is partly due to the fact that sheep and oxen, especially sheep, develop bony structure during the fattening process more than pigs. It is true that both sheep and pigs are, compared with oxen, fattened at an earlier stage of their development; but not only is the pig more naturally disposed to fatten instead of grow in frame very early in his career, if only liberally supplied with proper food, but the practice of feeders, to meet the demands of the market, is to encourage growth as well as fattening much more in the case of sheep than of pigs.

Comparing the constituents stored up in increase for a given amount of dry substance of food consumed in each case, the table shows that for 100 gross dry substance of food, the oxen and sheep stored up less than 1 per cent., and the pigs more than twice as much of nitrogenous substance; that of fat the oxen stored up only 5·2, the sheep 7, and the pigs 15·7 parts.

Or, looking at the subject from another point of view, the last column of the table shows that for 100 nitrogenous substance of food consumed, the oxen and sheep stored up little more than 4, but the pig about 13·5 parts; that for 100 non-nitrogenous substance in food, the oxen yielded 7·2, the sheep 9·4, and the pigs 1·85 parts of fat in increase; and that for 100 mineral matter consumed, the oxen stored up 1·9, the sheep 3·1, and the pig 7·3 parts.

That a very much larger proportion of the constituents of the food of the pig than of that of oxen and sheep should be stored up as increase is, however, only what we should expect, when we consider that the former consists of matured grain, and the latter chiefly of comparatively immatured vegetable produce, containing a large proportion of indigestible woody matter, and also a larger amount of nitrogenous and mineral matter in proportion to its digestible and available non-nitrogenous constituents.

But whilst the pig, with his much higher character of food, gave so much more increase than the sheep for a given amount consumed, and the sheep more than the ox, the ox returned as manure 36·5 per cent. of the dry substance he consumed, the sheep about 32, and the pig only 16·7 per cent. The proportion of the consumed matter that was lost by respiration was, on the other hand, rather the lowest with the ox, namely, 5·73 per cent; whilst with the sheep it was 60·1, and with the pig it was 65·7 per cent. Or, reckoned in proportion to a given amount of increase produced, the oxen gave for 100 lbs. of increase,

57·3



in live weight, 404 lbs., the sheep, 291, and the pigs only 70 lbs. of dry substance in manure ; and for the same amount of increase, the oxen lost of dry substance, by respiration, 636 lbs., the sheep 548·5 lbs., and the pigs. 276·2 lbs.

There is another point from which it is desirable to view the difference of result obtained with the different descriptions of animal. This is illustrated by the figures given in Table IV., which shows for oxen, sheep, and pigs, respectively, the amounts of increase yielded, and of dry substance consumed in food, voided as manure, and lost by respiration, per 100 lbs., live weight per week.

TABLE IV.—*Amount of Increase yielded, and of Dry Substance consumed in Food, recovered as Manure, and lost by Respiration, &c., per 100 lbs. live weight per week.*

	Per 100 lbs. live weight per week.			
	Increase Yielded.	Dry Substance.		
		Consumed in Food.	Recovered as Manure.	Lost by Res- piration, &c.
	lbs.	lbs.	lbs.	lbs.
Oxen, . . .	1·13	12·5	4·56	7·16
Sheep, . . .	1·76	16·0	5·10	9·62
Pigs, . . .	6·43	27·0	4·51	17·74

The first column of this table shows that whilst the pig increases from 6 to 6½ per cent. of its weight per week, the sheep increases only 1¾, and the ox little more than 1 per cent. No wonder, then (to say nothing of the difference in the character of the food), that the oxen and sheep, requiring so much longer time to add a given proportion to the weight of their bodies, should consume so much more food, void so much more as manure, and expend so much more in respiration, for a given amount of increase produced, as we have seen they do.

The other columns of the table show, however, that neither the amount of dry substance of food consumed, nor the amount lost by respiration, by a given weight of animal within a given time, is in excess with the pig in anything like the proportion that its increase exceeds that of the other animals. In other words, the much higher character of the food of the pig shows itself in the much greater rapidity, and the much greater proportion, of its conversion into meat—the most valuable product of the feeding operation.

Lastly, in regard to the results in this table, it is remarkable that, whilst, for a given weight of the body within a given time, the amounts of increase yielded, and of dry substance consumed in food, and lost by respiration, are so very different for the different animals, the amounts of dry substance voided in excrements are almost identical. I shall show further on, that the limit of consumption is much regulated by the amount of non-nitrogenous substance contained in the food ; and hence it would appear that the respiratory function had much to do with determining the amount of food consumed. It would also seem, from the equality of amount of dry substance voided by a given live weight of the different descriptions of animal within a given time, that the limit of consumption had also some connection with the amount of transformed and effete matter that the system could pass ; and hence that the surplus available for increase was fixed by the necessary proportion of digestible and assimilable to effete matter in the appropriate food of the respective animals.

To sum up the points thus far illustrated it may be said—

1. That during the fattening process the proportion, in a given weight of the

body, of water, mineral matter, and nitrogenous compounds decreases, whilst that of the fat very considerably increases.

2. That the carcass parts or saleable meat increase more rapidly than the internal parts or offal.

3. That the amount of dry substance of food required to produce a given weight of increase is larger with the ox than with the sheep, and larger with the sheep than with the pig.

4. That the dry substance of the food of the ox contains a larger proportion of indigestible matter than that of sheep, and that of sheep more than that of pigs.

5. That oxen require from five to six, and sheep from three to four times as much time to add a given proportion to the weight of their bodies as pigs.

6. That the greater portion of the nitrogenous and mineral matters of the food is recovered in the manure; and that the greater part of the non-nitrogenous substance is lost by respiration, and other exhalations—a much smaller proportion being retained in the increase, or voided in the manure.

7. That for a given amount of increase produced, oxen void considerably more substance as manure, and expend more in respiration, &c., than sheep, and sheep very much more than pigs.

8. That for a given weight of dry substance consumed, oxen void more as manure than sheep, and sheep much more than pigs; but oxen respire rather less than sheep, and sheep rather less than pigs.

9. That in proportion to a given weight of animal within a given time, oxen both consume and respire less dry substance of food than sheep, and sheep very much less than pigs; but they void almost identical amounts of dry substance as manure.

#### COMPARATIVE FEEDING VALUE OF DIFFERENT FOODS, ACCORDING TO THEIR COMPOSITION.

Thus far I have endeavoured to indicate the characteristic points of distinction between the food of the ox, the sheep, and the pig, and to show in what respects its constituents are differently disposed of by the different animals; and for the purposes of my illustration, I have supposed the animals to be fed on such foods as are recognised as appropriate to them, and in such proportion and amount as experience justifies. I now propose to say a few words on the relative feeding properties of different foods, according to their composition.

Leaving out of view, just now, the incombustible or mineral constituents, it will be convenient, as before, to consider the other constituents of food to be grouped under the heads of nitrogenous and non-nitrogenous substances.

Among the nitrogenous substances, the most important of those which enter into our stock foods are albumen, casein, legumin, and gluten; and chemists and physiologists are accustomed to speak of these—the nitrogenous compounds—as the flesh forming substances.

The non-nitrogenous constituents of our stock foods are starch, sugar, gum, pectin, oil, and cellulose or woody fibre, in different conditions of digestibility or induration. The non-nitrogenous compounds are spoken of as the respiratory or heat-producing, and fat-forming substances.

Now, writers on agricultural chemistry and physiology have generally assumed, that it is chiefly the proportion of the nitrogenous or so-called flesh-forming substances contained in them, which determines the comparative value, for feeding purposes of different foods.

The coloured diagram before you will enable you to judge whether or not this supposition is justified by the practical experience of feeding. This diagram has been constructed by the animals themselves. They know nothing about nitrogenous or non-nitrogenous constituents, digestible or indigestible cellulose, and so on; but they are gifted with an unerring instinct which enables



them not only to distinguish between substances which are and are not food, but also to select from a variety of food stuffs those which are most suitable for the requirements of the system, and so to indicate to us the proper amounts and proportions of the different constituents.

In the experiments to which the diagram refers, as well as in many others, the plan has been to select foods containing very different proportions of nitrogenous and non-nitrogenous compounds; in fact, some containing two or three times as much nitrogen as others. We have then given to one set of animals a small fixed amount daily, of food containing a low percentage of nitrogen, and allowed them to take as much as they chose of another food, different in composition in this respect. To another set we have given a limited amount of food, rich in nitrogenous compounds, and allowed the animals to take, *ad libitum*, of a different description of food, and so on. In this way they have been enabled to fix for themselves the limit of their consumption of nitrogenous and non-nitrogenous constituents respectively, according to their wants.

The diagram shows the results of such experiments with pigs; and the foods employed were Indian corn meal, barley meal, bean meal, lentil meal, bran, and dried cod-fish, used alone, or in combination, as the case might be. Black being taken to represent nitrogenous substance, red non-nitrogenous substance, and green total dry organic matter (nitrogenous and non-nitrogenous together), the diagram is constructed as follows:—The smallest quantity of nitrogenous, or non nitrogenous, or total organic matter consumed in any one experiment is reckoned as 100; and the several lines above the base line, which is marked 100, indicate larger amounts, corresponding to the figures given at the side of the diagram.

The upper portion shows the relative amounts of each constituent consumed in each experiment per 100 lbs. live weight per week; that is to say, by a given weight of animal within a given time. A glance shows you that the height to which the colours representing the non-nitrogenous or the total organic substance reach is very much more uniform than that indicating the consumption of nitrogenous substance. In fact, it is perfectly clear that the animals were guided in the amount of food which they consumed by the amount of non-nitrogenous, and not by that of the nitrogenous, constituents which it supplied.

But, according to current theories, the amount of nitrogenous substance ought at least to determine the amount of increase produced. The lower portion of the diagram shows what the animals have to say on this point. The arrangement is the same as before; but the results show not how much of each class of constituents was consumed by a given weight of animal within a given time, but how much was consumed to produce a given weight (100 lbs) of increase.)

Here again we see that the amount of either non-nitrogenous or total organic substance consumed varied comparatively little, whilst that of the nitrogenous substance consumed for the production of a given amount of increase varied from 100 to over 300 parts.

It is obvious, therefore, that both the amount of food consumed by a given weight of animal within a given time, and that required to produce a given weight of increase, were determined by the amount of available non-nitrogenous substance which the food supplied. The quantities required would, doubtless, have varied within even narrower limits, had all the foods contained equal proportions of indigestible woody matter.

It may be observed that it is doubtful whether pigs are able to digest cellulose, or woody fibre, at all; but there is no doubt, as the investigations of ourselves and others on the point sufficiently prove, that oxen and sheep are able to digest a considerable portion of such matter, when it is not in too indurated a condition.

It will, of course, be understood, that a certain amount and proportion of nitrogenous substance is essential in the food of animals; and if I were asked to state, in general terms, what was the approximate proportion of the nitro-



genous to the digestible non-nitrogenous substances, below which they should not exist in the food of our stock, I should say (though with reservations) about such as we find them in the cereal grains; and since few of our stock foods are below, and many above, this in their proportion of nitrogenous substance, it results that we are more likely to give an excess than a deficiency of such constituents, so far as the requirements of the animal are concerned. The value of the manure depends, however, very much on the amount of the nitrogen which the food contains; but to this point I shall recur after directing attention to a few more points in connection with the comparative values of different foods as such.

Some years ago we published the results of some experiments on the equivalency of starch and sugar in food, pigs being the subject of the trial. Several lots having each a fixed and limited quantity of lentil meal and bran allowed, one was permitted to take as much starch, another as much sugar, and another as much of the mixture of the two as they chose; whilst, in another experiment, the animals were allowed to select at discretion from lentils, bran, sugar, or starch, each placed separately within their reach. The result was, that sugar and starch were found to have, weight for weight, practically the same value as constituents of food.

These results would, *a priori*, lead to an answer in the negative to the much agitated question, whether there is any advantage in malting barley for feeding purposes. The chief effect of the malting process is to convert starch into sugar—not, it is true, sugar of exactly the same description as that used in our experiments; but there is good reason for supposing that malt sugar would have a lower value than cane sugar as a food constituent; and direct experiments, made many years ago at Rothamsted, have shown that a given amount of malt, mixed with other food, gave less rather than more increase than the amount of barley from which it was produced. It is obvious, too, that as the conversion of barley into malt is a manufacturing process, attended with considerable cost, as well as actual loss of substance, the remission of the duty on malt employed for feeding purposes would not be likely to be of benefit to the farmer, unless either a given amount of malt sugar proved to be of considerably higher feeding value than the starch from which it was produced, or the other constituents were rendered more digestible and assimilable by the process.

This leads me, before leaving the subject of foods, to make a few remarks on some other manufactured foods for stock. Many complaints are made, and justly made, of the adulteration of oil-cakes; and it is sometimes asserted that cheaper and better foods than the average of cakes now in use could be manufactured with advantage both to the maker and to the feeder. Linseed and other cakes are themselves, in one sense, manufactured foods. But the object of the manufacturer is not the production of cake, but of oil. If the farmer did not use the cake at all, it would still be made, and the oil would be sold for a higher price. As it is, the manufacturer makes the cake as a bye-product, and the price he gets for it enables him to sell his oil so much the cheaper.

But if manufactories were set up for the special purpose of preparing foods for stock, the whole cost of the undertakings must be charged upon the food. Lentils, beans, peas, Indian meal, barley meal, linseed, and other good staple foods must be used; and although it might be possible so to combine foods together that a given weight of the mixture would possess a somewhat higher feeding value than the component parts used singly, there is every reason to suppose that the increased cost would more than counterbalance any slight benefit that could be derived in that way. Nor do I anticipate that the progress of science will aid us much in this direction. Condimental foods have been tried, and found wanting; and I have little doubt that a similar result will attend the manufacture and use of simpler food mixtures. Our hopes as feeders must be in increased and cheap supplies of ordinary cattle foods of good quality, rather than in submitting those we have to costly processes of manufacture.



The results arrived at in regard to this portion of the subject may be briefly summed up as follows:—

1. The comparative feeding value of our current stock food depends more upon the proportion of the digestible non-nitrogenous substances they contain than upon their richness in nitrogenous compounds ; but the richer the food in nitrogen, the more valuable will be the manure.
2. Of the non-nitrogenous constituents of food, starch and cane sugar have, weight for weight, nearly equal feeding values ; malt sugar has probably rather a lower value than either cane sugar or starch ; digestible cellulose, in moderate proportion, has, for ruminant animals, probably nearly the same value as starch ; and fat or oil have probably about two and a half times the value of starch for the purposes of respiration, or the storing up of fat in the body.
3. Some advantage results in a feeding point of view from the judicious mixture of a variety of ordinary stock foods ; but the benefit to be derived in this way is not such as to compensate for the extra cost of a special manufacturing process to attain it.

CONNECTION BETWEEN THE VALUE OF THE MANURE AND THE COMPOSITION OF THE FOOD CONSUMED.

The next and last branch of the subject relates to the comparative value of the different constituents in the liquid and solid voidings of the animals, and to the connection between the value of the manure and the composition of the food from which it is produced.

I have already pointed out that the greater portion of the carbon, hydrogen, and oxygen of the food either passes into the increase or off in respiration, and that comparatively little of any of them is recovered in manure. By far the larger portion of the nitrogen, and nearly the whole of the mineral matter consumed, are, however, so recovered.

To show the economic connection between the feeding of stock for the production of meat and manure, and the growth of corn, I propose to adduce a few results obtained in experiments on the growth of wheat by different manures. In the experiments in question, wheat has been grown for twenty successive seasons on the same land.

In Table V. are given the average annual produce of corn and straw, and the estimated yield of carbon per acre, over the last twelve years, respectively without manure, with mineral manure alone, with mineral and nitrogenous manure (ammonia salts), and with farm-yard manure.

TABLE V.—Average Annual Produce of Wheat, and estimated yield of Carbon, per Acre, over 12 years.

Manures, per Acre, per Annum.	Average Annual Produce, per Acre.			
	Dressed Corn.	Total Corn.	Straw.	Carbon.
	Bushels.	lbs.	lbs.	lbs.
Unmanured, . . . . .	15½	964	1662	1062
Mineral Manure alone, . . . .	18½	1157	1897	1234
Mineral Manure and 400 lbs. } Ammonia Salts, . . . . . }	36½	2275	4212	2625
14 Tons Farm-yard Manure, .	35½	2232	3869	2467

Where the farm-yard manure was employed, more carbon, as well as more of every other constituent, was annually applied in manure than removed in the crop. In the other cases no carbon whatever was supplied in the manure ; and yet it will be observed that where the mineral manure and ammonia salts were

employed (the latter containing a large amount of nitrogen), the yield of carbon was greater than where a large amount of that substance was supplied by means of farm-yard manure. This carbon must have been derived from the atmosphere. In several experiments in this field last year, from  $1\frac{1}{2}$  to  $1\frac{3}{4}$  tons of carbon per acre were removed in the crop, without any being supplied in manure; but in these cases large quantities of nitrogen were supplied.

The quantity of carbonic acid required to yield  $1\frac{1}{2}$  tons of carbon to the crop is about as much as would be given off into the atmosphere in a year by 22 individuals of a mixed population of both sexes and all ages, and it will be seen that it is under the influence of ammoniacal or nitrogenous manure that this large amount of carbon has been fixed in the plant from the carbonic acid of the atmosphere.

The results given in Table III. showed how small was the proportion of the nitrogen consumed by an animal in its food, that was stored up in its increase and sent to market as meat. If there were none of the nitrogen of the food lost in the various exhalations from the body, the whole of that not stored up in increase would be found in the manure. But the investigations of ourselves and others show that a certain portion of the nitrogen is so lost. Our own experiments to determine the limit of this loss, and the circumstances under which it is greater or less, were commenced as far back as 1847, and have been resumed occasionally from that time to the present; and during the last few years we have collected a great deal of experimental data on the subject; but as the whole of the analytical work is not yet concluded, I do not feel that I am in a position to give any numerical statement of the results obtained. It may, however, be stated as beyond doubt, that by far the larger portion of the nitrogen consumed in food is rejected by the animals in their liquid and solid voidings, and that the higher the proportion of nitrogen in the food the richer will be the excrements in that important constituent of manures.

Some years ago I published a table showing the estimated value of the manure obtained from the consumption of 1 ton of different articles of food used in ordinary farm practice. The valuation was founded upon a knowledge of the average composition of the different descriptions of food, and upon information, arrived at in the course of experiments just referred to, as to the probable average amount of the constituents of food valuable for manure which will be obtained in the solid and liquid excrements of the animals.

Stating the results of these valuations in very general terms, it may be said that the estimated value of the manure from 1 ton of oil-cake was considerably more than that from the same quantity of linseed, lentils, tares, beans or peas; from two to three times as much as that from 1 ton of oats, wheat, Indian corn, barley, or hay; from seven to ten times as much as from the same weight of oat, wheat, or barley straw; and about twenty times as much as from 1 ton of roots.

It is obvious, therefore, that in the selection of purchased foods for stock, it is very important to consider their manuring as well as their feeding value. One illustration on this point will suffice. A ton of locust beans will certainly not yield nitrogen in the manure of the animals consuming it equal to more than, if to as much as,  $\frac{1}{4}$  cwt., or 28 lbs., of ammonia; but a ton of rape-cake will yield 1 cwt., or four times as much. If, therefore, we take the ammonia in the manure at 7d. per lb., the amount of it obtained from the consumption of a ton of locust beans will be worth only 16s. 4d.; whilst that from the ton of rape-cake will be £3, 5s. 4d.

There is, in fact, far greater difference in the manuring than in the feeding value of most of the ordinary stock foods in the market.

In illustrating the comparative value of the manure obtained from different foods, by reference merely to the amounts of nitrogen or ammonia yielding matter which they supply, it will not be understood that I in any way ignore or under-rate the value of the mineral constituents associated with the nitrogenous matter in the excrements. But, inasmuch as the amount of mineral constitu-



ents voided is generally in excess of that required for the due effect as manure of the nitrogen with which they are accompanied, it results that the amount of the nitrogen or ammonia yielding matter is practically the best index to the value of the manure.

#### APPROPRIATENESS OF ANIMAL FOOD IN THE DIET OF MAN.

It will be obvious that the importance of the subject which I have brought before you this evening rests upon the assumption that animal food is an important element in the diet of man. There are, indeed, some who maintain that a purely vegetable diet would be more suitable and natural than the mixed vegetable and animal one so generally preferred. If their view were adopted, we need no longer trouble ourselves about the connection between the food, the increase, and the manure of fattening oxen, sheep, and pigs. There are, however, various circumstances, economical and physiological, pointing to the appropriateness of admitting a certain proportion of animal food into the diet of man. To one or two of these I will briefly refer.

Walking is for man undoubtedly a very natural means of progression. Still, it is often very advantageous to ride, and so to employ the legs of a quadruped instead of our own. In eating meat we may be said to employ the stomachs of other animals to do that which we could not so well do with our own. As a few ounces of gold are separated from many tons of rock by the combined aid of mechanical and chemical processes, so the animals feeding upon crude, and often to us indigestible, vegetable matter, eliminate from it, and store up in their bodies, some of its constituents in a form at once much more concentrated than that in which they consumed them, and much more easily appropriated by the human economy. A given amount of nitrogenous compounds in the form of meat is undoubtedly more easily digested and assimilated by man than if the same amount were supplied in the form of beans. Then, again, the animals convert starch, sugar, &c. (and probably some of them cellulose, which we could not digest at all), into fat, which has twice and a half the respiratory and fat-storing capacity of the substances from which they produce it. It is, doubtless, true that man can produce fat, and keep up his respiratory function, from starch and sugar; but it can hardly be doubted that there is some economy to his system in having a portion of fat supplied to him ready made.

Apart from the strong testimony of common experience on the subject, there is evidence in the comparative structure of man that he is adapted for a concentrated form of food. One illustration, in passing, may be adduced on this point. Table VI. shows the proportion of the stomach, by weight, in a given live weight of oxen, sheep, pigs, and man.

TABLE VI.—*Proportion of Stomach in different Animals.*

Stomach in 100 lbs. live weight:—					
Oxen,	...	51 ounces.		Sheep,	... 39 ounces.
Pigs,	...	14 ,,		Man,	... 6 ,,

Relative weight does not, of course, necessarily represent with numerical exactness relative capacity or size. But there is little doubt that there is a gradation in the capacity of the stomach relatively to a given weight of the body in the animals enumerated in the order, and to a great extent in the degree, indicated by the figures given in the table. Admitting this to be the case, we have seen that the sheep, with its less proportion of stomach than the ox, takes a somewhat more concentrated food; and that the pig, with its much less proportion of stomach than the sheep, requires a much more concentrated food than the latter. May we not conclude that man in his turn, with his less proportion of stomach than the pig, will also appropriately take a more concentrated food than his useful friend?

The food of man is, indeed, very closely allied, in a chemical point of view, to that of the pig. The staple of the food of both the fattening pig and man, is cereal grain. The pig, it is true, consumes the husk as well as the farinal portion, whilst man does not; but we know that this proportion of indigestible woody matter is very nearly the limit of that which is appropriate for the fattening pig; and that on the addition of a small quantity of bran the proportion of increase diminishes, and that of the dry substance of the food voided as excrement increases. The only other essential difference is, that the pig takes, as a rule, the whole of his nitrogenous compounds in the form of vegetable products, and a much larger proportion of starch, and other non-nitrogenous compounds, more bulky in relation to their respiratory and fat-forming capacity than fat itself. Not, indeed, that the pig is at all unapt or unwilling to adopt even still more closely the diet of man; for he will take animal flesh and fat when he can get them, and, what is more, he likes them better cooked than raw.

Were it not, then, that man separates the husk from the flour, and that he gets lower animals to eliminate in an easily digestible form a portion of his nitrogenous aliment from foods which he could not himself readily digest, and that he gets them also to provide him with a portion of his respiratory and fat-storing food in the concentrated form of fat itself, we could hardly account for the less proportion to a given weight of the body of the stomach—the receptacle and first laboratory of the food—in his case than in that of the pig. We know, indeed, that in the cases where man is reduced to depend for nearly the whole of the non-nitrogenous constituents of his food upon starch, in the form of potatoes or rice, that there is a disposition to an enlargement of the abdominal organs, and to a diminution in physical and mental energy.

To conclude on this point, there can be no doubt whatever that the food of the labouring man is improved when he can add to his bread a portion of fat bacon, or butter, or fat in some other form, and it is better still if he can substitute or supplement a little butcher's meat. Indeed, that which common experience recognises as high quality of diet is, within certain limits, high proportion of animal to vegetable food, and with it high proportion of fat to starch and other non-nitrogenous compounds.

But not only do the animals which we fatten for our own food convert vegetable produce which we either could not digest at all, or could do much less easily than they, into concentrated and easily digestible and assimilable material for our use, but in doing this they supply carbonic acid to the atmosphere, and return the most important manurial constituents of their food in their excrements, thus providing, to both the soil and the atmosphere, from crude vegetable products, that which is necessary for the luxuriant growth of cereal grain, and other vegetable produce suited for the direct use as food for man.

Were it not for such compensations, by the increase of man and other animals upon the surface of the earth (if it could take place at all), by the enormous quantities of carbonic acid evolved into the atmosphere from the combustion of coal and from other sources, and by the gradual destruction of forests, which are the chief natural agents for restoring the balance, the purity of the atmosphere would become affected. But the grasses, which supply so large a proportion of the food of beasts, and the cereals and the other plants of the same great family, which supply food to man in almost every climate, serve to re-use the carbon given into the atmosphere in the form of carbonic acid. It may seem at first sight strange that the humble grasses, and the corn crops, reaching only a few feet from the surface of the ground, should be able to take up more carbonic acid, and evolve more oxygen, over an acre of land than an acre covered with forest trees. Still, there can be little doubt that more carbon is fixed in an acre of luxuriant wheat than over the same area of woodland; and there can be as little that an acre of sugar-cane would fix more than an equal area of the most luxuriant tropical forest.

*Conclusion.*—With a few general remarks of a practical nature, I will con-



clude my discourse. The great change which has taken place in the practice of feeding stock in modern times has consisted in bringing the animals much earlier to maturity, by means of careful breeding, and more liberal feeding. Scales and weights were seldom used in agricultural experiments until comparatively recently ; but there are some few records of the results of feeding as practised at the latter end of the last century, which will serve us in instituting a comparison between the results then obtained and those which are possible, or even common, at the present day.

In 1794 the Duke of Bedford made some experiments to determine the comparative feeding qualities of South Down, Leicester, Worcester, and Wiltshire sheep. Twenty of each were selected and weighed on November 19, 1794. To each lot were allotted sixteen acres of pasture, and in the winter some turnips were thrown upon the pasture, and a small quantity of hay was also provided. On February 16, 1796, after a period of sixty-five weeks of feeding, the experiment was concluded, and the sheep sent to market.

Over the whole period the sheep gave an average increase of between 40 and 50 lbs. per head ; and as their original weight was nearly 100 lbs. per head, they increased nearly 50 per cent. from the store or lean to the fat condition, which is the same proportion as that assumed in the illustrations to which Table III. refers.

Some years ago, I tried a set of experiments upon the comparative fattening qualities of South Downs, Hampshire Downs, Cotswolds, Leicesters, and cross-bred wethers, and cross-bred ewes, each lot consisting of between forty and fifty sheep. They were put up in November, when their weights averaged very nearly the same as those of the Duke of Bedford's sheep ; and when fat they had increased in about the same degree, namely, to an average of about 150 lbs. each. The Duke of Bedford's sheep were about sixty-five weeks in adding 50 lbs. to their weight, and mine in some cases 20, and in others a little more, or about one-third the time. It is somewhat singular that in May—the period in which my sheep were consumed as mutton—the Duke of Bedford's were weighed for the first time since the commencement of the experiment, and were found to have increased only about 6 lbs. per head.

The difference of result in these two cases was almost entirely due to the difference in the mode of feeding. Formerly, sheep received perhaps a few turnips on their pasture, and but little dry food, and that not of high feeding quality ; and the consequence was, that during the colder months of the year they either lost weight or increased but little. Now they have a liberal allowance of good food, and are frequently protected from the inclemency of the weather. In my own experiments, just referred to, the sheep were allowed from  $\frac{3}{4}$  lb. to 1 lb. of oil-cake per head per day, according to their weight, about the same amount of clover chaff, and as many swedes as they chose to eat : and they gave an average increase of nearly 2 per cent. upon their weight per week.

There is no doubt that in rapidly fattening stock at an early age, quality of meat is to some extent sacrificed to quantity. But it is only by means of the modern system of liberal feeding and early maturity that meat can be brought within the reach of the masses of the population. The farmer, too, must look to that system which will pay him the best ; and the difference between the price which the consumer will give for a pound of four-year-old and one-year-old mutton will only under very exceptional circumstances of locality remunerate him for the extra cost of production.

In conclusion, I have only now to thank you for the very kind attention with which you have followed me through what I fear may be thought by many of you somewhat tedious detail. The subject of the chemistry of feeding is, however, essentially an intricate one ; and I think you will have learnt from my lecture if you did not know it before, that there still remains much to be determined by careful investigation respecting it. But if I have in any degree succeeded in indicating the proper points of view from which this at once practical and scientific question should be studied, and in impressing upon your minds some

prominent and important facts regarding it, so as to lead to improvement in practice by a better knowledge of principle, or to further inquiry, and so to an extension of our knowledge, I shall feel that the objects of my desire and endeavour in addressing you have been fully attained.

*Average Composition, per Cent. and per Ton, of various kinds of Agricultural Produce, &c.*

	PER CENT.					LBS. PER TON.				
	Total Dry Matter.	Total Mineral Matter (ash).	Phosphoric Acid reckoned as Phosphate of Lime.	Potash.	Nitrogen.	Total Dry Measure.	Total Mineral Matter (ash).	Phosphoric Acid, reckoned as Phosphate of Lime.	Potash.	Nitrogen.
1. Linseed Cake.....	88.0	7.00	4.92	1.65	4.75	1971	156.8	110.2	37.0	106.4
2. Cotton Seed Cake..	80.0	8.00	7.00	3.12	6.50	1994	179.2	156.8	70.0	145.6
3. Rape Cake.....	89.0	8.00	5.75	1.76	5.00	1994	179.2	128.8	39.4	112.0
4. Linseed.....	90.0	4.00	3.38	1.37	3.80	2016	89.6	75.7	30.7	85.1
5. Beans .....	84.0	3.00	2.20	1.27	4.00	1882	67.2	49.3	28.4	89.6
6. Peas.....	84.5	2.40	1.84	0.96	3.40	1893	53.8	41.2	21.5	76.2
7. Tares.....	84.0	2.00	1.63	0.66	4.20	1882	44.8	36.5	14.8	94.1
8. Lentils .....	88.0	3.00	1.89	0.96	4.30	1971	67.2	42.3	21.5	96.3
9. Malt Dust.....	94.0	8.50	5.23	2.12	4.20	2106	190.4	117.1	47.5	94.1
10. Locust Beans.....	85.0	1.75			1.25	1904	39.2			28.0
11. Indian Meal.....	88.0	1.30	1.13	0.35	1.80	1971	29.1	25.3	7.8	40.3
12. Wheat.....	85.0	1.70	1.87	0.50	1.80	1904	38.1	42.0	11.2	40.3
13. Barley.....	84.0	2.20	1.35	0.55	1.65	1882	49.3	30.2	12.3	37.0
14. Malt.....	95.0	2.60	1.60	0.65	1.70	2128	58.2	35.8	14.6	38.1
15. Oats.....	86.0	2.85	1.17	0.50	2.00	1926	63.8	26.2	11.2	44.8
16. Fine Pollard.....	86.0	5.60	6.44	1.46	2.60	1926	125.4	144.2	32.7	58.2
17. Coarse Pollard.....	86.0	6.20	7.52	1.49	2.58	1926	138.9	168.4	33.4	57.8
18. Bran .....	86.0	6.60	7.95	1.45	2.55	1926	147.8	178.1	32.5	57.1
19. Clover Hay.....	84.0	7.50	1.25	1.30	2.50	1882	168.0	28.0	29.1	56.0
20. Meadow Hay.....	84.0	6.00	0.88	1.50	1.50	1882	134.4	19.7	33.6	33.6
21. Bean Straw.....	82.5	5.55	0.90	1.11	0.90	1848	124.3	20.2	24.9	20.2
22. Pea Straw.....	82.0	5.95	0.85	0.89		1837	133.3	19.0	19.9	
23. Wheat Straw.....	84.0	5.00	0.55	0.65	0.60	1882	112.0	12.3	14.6	13.4
24. Barley Straw.....	85.0	4.50	0.37	0.63	0.50	1904	100.8	8.3	14.1	11.2
25. Oat Straw.....	83.0	5.50	0.48	0.93	0.60	1859	123.2	10.7	20.8	13.4
26. Mangold Wurzel...	12.5	1.00	0.09	0.25	0.25	280	22.4	2.0	5.6	5.6
27. Swedish Turnips...	11.0	0.60	0.13	0.18	0.22	246 $\frac{1}{2}$	13.4	2.9	4.0	4.9
28. Common Turnips...	8.0	0.68	0.11	0.29	0.18	179 $\frac{1}{4}$	15.2	2.5	6.5	4.0
29. Potatoes .....	24.0	1.00	0.32	0.43	0.35	537 $\frac{1}{2}$	22.4	7.2	9.6	7.8
30. Carrots .....	13.5	0.70	0.13	0.23	0.20	302 $\frac{1}{2}$	15.7	2.9	5.1	4.5
31. Parsnips.....	15.0	1.00	0.42	0.36	0.22	336	22.4	9.4	8.1	4.9



## CORRESPONDENCE.

TO THE EDITOR OF THE VETERINARY REVIEW.

ALDERSHOT, 7th May 1864.

SIR,—In offering the following remarks, in continuation of those published in the Review this month, I wish it to be understood that they are written in good faith; and I also desire to express my obligation to Professor Gamgee, senior, for his remarks elucidating the parts in his essay to which I took exception, although I cannot perceive the analogy of the instances he adduces, in explanation of the previous statements above referred to.

In that part of his essay from which my first quotation was taken, the Professor's remarks are not confined to Turner or other writers, for he states, "contraction of the hoof has been always alleged as the precursor of navicular disease, besides an unknown quantity of bruising and concussion to the bone and its capsule from the ground," thereby including the opinions of *all*, however expressed, whether written or otherwise. I doubt not there are many veterinary surgeons who have asserted (although perhaps not in writing) quite the reverse of what has been now quoted, for the second time, from Professor Gamgee's *own* words, and not as a part of *the* author's writings, for which the Professor, as he truly states, is not responsible, although he is so for his own.

In the second place, at page 206 of the same essay, the Professor clearly discards "wet in any form," as a remedy to the foot of the horse in disease, and not as an ordinary application to the feet in health. It was for this reason I wondered at the anomaly, when I found, a few lines farther on, that he recommended warm fomentations to the feet for 15 minutes twice or thrice daily, during the acute stage. Professor Gamgee attempts to reconcile these apparently contradictory statements, by instancing the abuse of opium or spirits, and the use of either of these agents in proper and prescribed doses, and says, though he employs them in the latter form, he is not guilty of the former abuse. True, but if he had discarded them "*in any form*," as he did *wet*, he would have debarred himself from their use altogether. The connection between the morning ablutions and the placing the feet in "wet in any way," &c., appears still wider from the question; but if his feet happen to be inflamed, I venture to say, the placing them in warm water will afford immediate relief.

With regard to the part of the bone first affected with ulceration or absorption, I do not doubt the correctness of the Professor's proofs in the particular cases from which they were obtained; at the same time, I must be allowed to consider other specimens showing a different seat, as the commencement of the disease in the cases from which they were obtained, to be equally conclusive to my mind as are the Professor's specimens to his. I will, however, seek for fresh opportunities to prosecute the inquiry.—I have the honour to be your most obedient servant,

ALFRED J. OWLES,  
V. S. General Staff.

# EDINBURGH VETERINARY REVIEW

AND

## Annals of Comparative Pathology.

---

### ORIGINAL COMMUNICATIONS AND CASES.

---

*On Fractures of Bones and Strains of some of the great Ligaments and Tendons of the Limbs of the Horse.* By Professor GAMGEE, Sen., New Veterinary College, Edinburgh.

SOME hints communicated by myself to the "Sporting Gazette" in reference to these subjects, under the head "breaking down," and the recent accident to the filly Saragossa, with the discussions which have ensued, induce me to extend my observations on them.

A letter from Mr C. Devon, published in the "Sporting Gazette" of the 11th June, which is given at another place, demands special attention. The author asks if "Mr Gamgee can, according to his theory, connect the accident (fracture of metacarpal bone of a mare) with the previous weakness." Preferring not to hazard a direct answer to the question on the particular case, since I did not see the state of the leg before the mare started for the last race (though I am of opinion that the injury to the fetlock observed was not from a bruise), I shall treat on that and allied subjects generally.

The case on which Mr Devon also requests my opinion in reference to his brood mare, a well-formed animal, which produced two colts with diseased hocks by different and sound stallions, is interesting, and particularly so, since the history of the mare, so well followed up, shows that, more favourably kept in Ireland, her offspring were sound and good. This case is specially illustrative of the views I have endeavoured to convey in many of my published papers, as I have done in all my teaching. The lack of good form in the hocks, and proneness to disease, which was at length manifested in those joints of the two first colts, were, I have no doubt, "*entirely owing to the nature of the ground on which they were kept* in small short fields." Nothing is said about the winter accommodation of these colts,—most likely worse than their summer pasture, as is usually the case.

Foals and young horse stock, up to the time of their being taken into work, which are deprived of space for free exercise on well-drained, sound land, with ample provision of food in all sea-



sons, must of necessity lack form, texture, and strength, and are, in fact, prone in degree to the same conditions as constitute *rickets* in children, to puppies and animals of other species, bandy and bow-legs, with sprawling flat feet, represent the obvious consequences of conditions resulting from common causes.

Fractures of the bones of the foot of the horse happen differently, and to a greater extent than has been observed. Of the difference between the supposed and actual way in which these happen, I shall endeavour to explain as I proceed. The greater frequency of their occurrence than has been shown, is due to the fact, that many cases of fracture happen to processes or surfaces of bones which are not discovered, and either get right, like strains of soft structures, by rest, or become the seats of exostoses, and the causes of permanent lameness; the cases, however, which represent more fractures than has been shown are those where a shank, or pastern, bone is reported to have been fractured, and the horse destroyed, without sufficient subsequent investigation of all the bones below, and of those structures which act in connection.

It is not until phenomena have been repeatedly observed that their relation to common laws is seen, and the interest of the investigator is excited to prosecute further and constant researches.

I saw my first case of fracture of the metecarpal bone of a horse, which happened whilst running a race, about thirty years ago. I was near the spot where it happened, and saw the distal part of the limb dangling in the air, with the bone protruding through the skin, as the agonised animal stood on three feet, with the arm of the injured one extended and elevated. I obeyed the summons of the owner by at once terminating the animal's misery; the carcass was carried away, and I learned little at the time from the case.

About the time the above case happened, the filly May-day, belonging to Lord Berners, broke her leg whilst running for the Oaks; and ten years after that, a horse running for the Derby stakes, in the year of Orlando and Running Rein (the name of the animal in question I have neither in memory or at hand, but which was said to have been fraudulently entered, and was four years old), also broke a leg. These, like more cases of similar occurrence, were buried, and nothing was learned from them.

A case of fracturing into atoms of both navicular bones, which happened to a horse I was riding of my own, and which occurred a few years earlier than those referred to,—I having previously performed the then much extolled, and, in my present belief, barbarous operation of neurotomy—I shall not import a full description of, because I regard a subject so mutilated to be unreliable for the establishment of any data on which to found sound conclusions.

It has only been in recent years, after much research, which led to an entire change and enlargement of my views on the

structure and functions of the limbs, that I made the most of cases of fractures which came under my observation in the course of practice, and to which I made additions by searching the horse-slaughtering places frequently.

A case which afforded me the greatest extent of instructive work and study, and showing the mode of occurrence of fracture up to the time it happened, was that of a mare, in the practice of our friend, Mr W. Robertson of Kelso, to whom I am indebted for three of the feet sent to the New Veterinary College, and for the history of the subject. The case, which happened in March 1863, is reported in this Review for that year at page 436. A Report of the Analysis of the Coffin-bone of this subject, by Dr Arthur Gamgee, will be found annexed.

I am also indebted to the records of the late Mr John Field for some cases of fracture, of much interest, and which were most kindly forwarded to me, on request, by Mr W. Field of Oxford Street, editor of his lamented and talented brother's work.

Fractures of bones in the horse are of rare occurrence in the way of their happening to man, viz., by external violence. In human surgery, almost every bone in the frame is at one time or other met with fractured and crushed through some accident, and though horses do occasionally fracture some one of the shaft bones of the limbs by a fall, and the same happens by kicks from other horses, the majority of fractures happen to the horse under the exertion of muscular force. Two causes may prevail, either of which, as I have said in a recently published paper, tend to the same result, viz., a weak, imperfectly developed, state of bone, or a diseased condition acquired; and also through the preponderance of muscular power under nervous energy, over the strength of bone.

These fractures in the bone take place chiefly in three ways:—*Firstly*, By a superficial part of bone giving way where a tendon or ligament is inserted, or attached at one of its extremities; *Secondly*, The cylindrical bones of the limbs break transversely; and, *Thirdly*, The short bones, viz., large and short pastern bones, those of the knee, &c., split up in vertical lines.

The first in the above order are perhaps of most common occurrence, as preceding both of the other kinds which follow through the loss of the sustaining fibrous structures. I have in my possession, or rather amongst my own collection of specimens at the New Veterinary College, the means of illustrating all these conditions; though the love for investigation, and the clear impressive evidence afforded, can only be fully experienced by the examination of all the conditions by dissection of fresh subjects; indeed I feel that otherwise the subject must be dry, and little intelligible to the reader, even were it narrated in a more captivating style than I have the power to impart to it. In some of my papers, dispersed throughout the pages of the last two volumes of the "Edinburgh Veterinary Review," I have



gone more into details on the mechanism of the limbs of the horse, an understanding of which is most essential to that of the derangements which happen to it, and these were written in the only way by which reading and further investigation can be effectually prosecuted—with the dissecting scalpel at hand, and the parts treated on lying on the same table as that on which the ink-stand was placed; in such a way only will nature's laws be revealed, when the different phenomena, one after another, may not only be seen but felt.

I believe that further inquiry will at some early period show, relatively to the labour and talents devoted to the subject, how one great fracture in the region of the foot of the horse has been found to follow on a slighter admonitory injury sustained; and possibly Mr Devon's case referred to was one in point.

A very important case is related amongst those already referred to by the late John Field, which is to be found at page 35 of his published records. It is that of a horse, after being violently galloped in Rotten Row, and pulling up lame, was afterwards walked to the infirmary in Oxford Street, where it was discovered that one of the pastern bones of a fore limb was fractured, for which the animal was put under treatment, when, during the ensuing night, the shank-bones of both hind legs were observed to have given way, and the large pastern bone of the other fore leg was also found to be broken. Faithfully and admirably as the above case is handed down to us, if with our recently acquired views on the subject we had the morbid parts before us to dissect, there would be no difficulty in discovering all the lesions in the order of sequence in which they occurred, when those which were most obvious would be found to have been the last parts in the order of occurrence to give way.

Another case, reported by the same able authority, I will refer to for illustration, and shall submit some comparative views relative to the function of the limb. At page 41 of "Field's Veterinary Records" is the report of the case of a horse becoming suddenly lame after being galloped violently in Hyde Park and pulled up suddenly.

The horse was treated by the Messrs Fields, then turned into the straw-yard, and at length recovered from the lameness, but owing to another accident which befell him, he was destroyed; when, on examination, it was discovered that both sesamoid bones of the previously injured pastern joint had been fractured through their longitudinal axis, and that subsequent reunion was established.

The fractures having occurred to the horse, says the faithful narrator, "by the immense concussion which the leg sustained when the weight was so suddenly thrown on it in stopping him."

Though it is not distinctly expressed, it is none the less clearly implied that it was the weight brought suddenly and violently on to the sesamoid bones which fractured them. I therefore take

this opportunity of stating, in opposition to the physiological notions then and hitherto held, that the sesamoid bones in this case, as in all those of similar occurrence, were broken, not by any downward bearing suddenly sustained, which might have split the pastern bones, but it was the uplifting action alone that produced the result to the sesamoids, caused probably by a convulsive jerk, while stopping the horse suddenly; this explanation I submit, in order to keep the way clear for future discussions.

Strains are of common occurrence to the limbs of horses while under exertion; when the strong *inelastic* fibrous tendons and ligamentous structures become affected. The accidents are liable to happen in various parts of the body, but those to which attention is now directed, which befall horses under trials of exertion and speed, have their seat in the lower part of the limb comprised in the space limited to a few inches above the knee and hock joints, and the planter region of the coffin-bone; and from this comprehensive view we may mention some localities where the occurrence is most frequently and obviously seen.

The fore-legs of race-horses, that class in which strains most frequently happen, are much more commonly affected than the hind, for the plain reason, that notwithstanding the greater substance in the fore legs, they having to sustain the greater exertion, and being endowed with more range of action, and also having to raise the body as well as bear it over the fulcra, they most frequently suffer from complicated injuries.

Midway between the knee and the fetlock joints, is the most common seat of strain of the tendons of horses under work on the turf, which happen either in training or whilst running. No exactly analogous accident to the above described happens to the hind leg: there is a difference in the anatomical construction, and also in function, which excludes the same liability to it. Curb, or strain of structures behind the hock, and strains near the fetlock joint, represent the usual seats of disease from over-taxed exertion in the hind legs. A horse under severe exertion, at full speed, sometimes strains the fore leg above the knee; the injury is sustained by the strong bands on the inside passing downwards over and below the joint which are the most powerful appendages of the radius in raising the body over the fulcrum. That excellent race-horse, Carabineer, sustained his injury to this part which led to the close of his racing career; on hearing of the case of that horse, it not being of common occurrence, I undertook a journey to Aske, the seat of the noble owner, to see the case, and verify all detailed particulars in it. Well-formed and powerful as the knee and arm of that horse appeared, it was easy to conceive that, with his deep and lengthy chest, and great sweep of shoulder action, a degree of force was thence derived, which by the free will of the generous animal, whilst making efforts in turn opposed by Asteroid and Tim-Wiffler, under



great weight was enough to break up any ordinary structures on which such force acted.

Other causes than those noticed give rise to fractures and strains of parts within the hoof and to other parts of the limbs of the horse—the state of the feet, as to their form, freedom from restraint, and pain, or the reverse, influence exemption or proneness to their occurrence.

There is a broader view to be taken of these questions than men seem disposed to entertain with merited earnestness, and but for its great importance, I would not intrude my views on the reader of this “Review” so repeatedly as I do—it is the construction and movements of the limbs to which I allude. This subject may be laid down for consideration under several denominations. In a former paper, when I adopted the phrase, “Physiology of Locomotion,” the reviewers groaned, and thought the subject looked “bookish”—as if not to the level of ordinary understandings. Well, call it something,—“form and action,” according to Percivall; shape, make, and stepping in horse market phraseology; or the philosophy of action; anything, in fact, so that the mind can be brought to bear on the subject of inquiry and follow it up. Therefore, as I shall not go into the formation of the foot, but say a few words on the economy of the limbs of the horse, I venturing to use my same title—say on the Physiology of Locomotion or Action. Firstly, then, be it understood that the feet do not move the body, but it is the passive agents which the distal or lower part of the limbs constitute, which are acted on by the animal machinery above; hence locomotion ensues. For instance, we see a cripple on our foot-paths, or in a hospital ward, moving on two crutches—he fixes the bottom-ends of these on the ground, and the tops under the arm-pits, and with the muscular power of his body bears himself over the fulcra below.

A still better instance is that afforded by the street-going athletes of London, where they may be seen perched up on two high poles, and moving by virtue of the muscular power of the body acting on the cumbersome jointless wooden pillars which are converted into levers. A consideration of the inimitable mechanism of the horse’s legs can only be approached with diffidence after such rude examples, still the more exquisite of human contrivances help on towards demonstration—the paddle-wheels of a steam-ship afford other instances; the force of action being generated within the vessel, the faculty of bearing the strain on the axle and paddles.

Now, when people persist in talking about elastic structures, and attribute the property of elasticity to some of the greater of those making up the bulk of what by a license we call the horse’s leg, they must have a surprising elasticity of imagination to accommodate itself to interpret the laws of such obviously contradictory phenomena. If what they call the suspensory ligaments

elongated ever so little, such property would tend to nullify the laws which govern their functions. No, but instead of these being endowed with stretching properties, I contend that they are unyielding, as I have proved them to be by anatomical investigation, no less than under physiological observations, and sustain my point and say, that by co-operation with the bones, these pliable, tough, and unyielding bands, contribute their assigned part, and are simply the foot's strong stays, and the invariable holds-fast of the whole limb no less than between any series of bones.<sup>1</sup>

---

*Note on the Chemical Composition of the Bones, in a case in which Fracture of the Navicular Bones of the Hind Feet of a Mare, accompanied by Detachment of the Perforator Tendon from the Pedal Bones, occurred as a result of violent muscular efforts.*  
By ARTHUR GAMGEE, M.D., Assistant to the Professor of Medical Jurisprudence in the University of Edinburgh, Lecturer on Chemistry in the New Veterinary College, &c. &c.

In the July number of this Journal for 1863 (at page 436), my father placed on record the results of the anatomical examination of the feet of a mare, which had been the subject of a most curious accident.

Without attempting here to repeat the details of the case, for which I must refer my readers to the pages of the Journal in which they appeared, I may remind them that the subject of the paper was an aged mare, which, after suffering from symptoms of lameness for some time, on being walked a very short distance staggered and fell, and was unable to rise. An examination of the body of the mare revealed the cause of her fall, for it was found that the navicular bones of both hind feet had been split up, and that the cartilaginous and tendinous structures of all four feet had sustained very remarkable injuries. Attention was particularly directed to the obviously altered and diseased structure of the bones, which were saturated with blood, and appeared charged with fat. The alteration in structure had obviously been the precursor of, and had to a great extent been the cause of, the accident which had occurred.

Feeling anxious to ascertain the nature of the chemical changes which had taken place in the bones, my father requested me to subject them to a chemical analysis. I did so very shortly after the case occurred, and I now publish the results, as they are in the highest degree interesting.

The bone handed to me for analysis was a portion of the coffin-bone of one of the hind feet. Care was taken to remove a piece involving the whole thickness of the bone, so that it might cor-

---

<sup>1</sup> Since the foregoing was sent to press, attention has been drawn to a case of fractured sesamoid bones sent by Mr Blakeway to Professor Varnell with letter, which, with the latter's report, is reproduced, from the "Veterinarian," as another important contribution of fact.



rectly represent its average composition ; for the structure of the more external portions of the coffin-bone differs in physical appearance and density from the internal, and differs, doubtless, to a certain extent, in chemical composition. The bone analysed presented, in the highest degree, the characters to which I previously alluded, as observed in all four feet ; for in addition to the rusty colour, the texture was so saturated with fat, that on filing it, a mixture of fat and bone dust adhered to the file in little masses ; and as a result of the filing, instead of obtaining as usual a white dust, we noticed a yellow pasty mixture of fat and bone dust.

The results of the analysis may be plainly stated in a few sentences.

1. The salts which give to bone its hardness and toughness were diminished in amount. The amount of carbonate of lime differed far more from the normal standard than did that of the bone-earth. (Phosphate of lime and phosphate of magnesia.)

3. The amount of cartilage was considerably increased.

4. The amount of fat was enormously increased.

In order that the reader may be able to perceive the chief changes which have occurred in the composition of the diseased bone, I have placed by the side of the tabular statement of its analysis, one made by Von Bibra of the femur of an aged mare (aged 14 years). It may be questioned, however, whether the composition of the femur represents accurately that of the coffin-bone ; it probably does not, for the more spongy undoubtedly contain more organic matter than the more dense and solid bones. I had intended to make a complete analysis of a healthy coffin-bone, but my occupations have prevented my doing so. I, however, have ascertained the proportion of organic matter and salts in a very healthy coffin-bone, and for purposes of comparison, I shall place it by the side of the other analysis. The organic matter represents, in this case, almost entirely cartilage, as the amount of fat present was extremely small.

	Healthy Coffin-bone.	Diseased Coffin-bone.	Femur of mare aged 14 years.
Organic Matter, in 100 parts,	47·43	55·4	32·19
Salts, . . . .	52·57	44·6	67·81
Cartilage, . . in 100 pts.	. . .	37·85	27·98
Fat, . . . .	. . .	17·55	4·21
Phosphate of Lime and } Phosphate of Magnesia, }	. . .	39·07	56·13
Carbonate of Lime, . .	. . .	2·66	11·28
Soluble Salts and loss, .	. . .	2·87	·40

There appear to be various causes which may confer upon bones the property of breaking when subjected to slight strain or exertion. Sometimes, as observed in old men, the earthy matter greatly preponderates over the cartilage, or sometimes, as in ricketty children, the cartilage is not sufficiently hardened by earthy matter. Either of these states unfit the bones for their functions by depriving them of their hardness and toughness;—the bone which contains too little cartilage snaps when subjected to a strain; the soft rachitic bone bends, and even breaks under the weight of a body which its altered structure can no longer support. But besides these, other conditions exist which even more frequently than those just mentioned confer upon bones the property of breaking readily. In the disease known as osteomalacia, where this tendency to fracture exists, not only is the quantity of the earthy salts diminished, and the quantity of cartilage increased, but there is in addition an enormous excess of fat. The amount of this ingredient has sometimes been found to be as much as 25 and 30 parts in 100 of the dried bones, although these numbers can scarcely be said fairly to represent the majority of cases of the disease. The chemical composition of the bones which I subjected to analysis, and which form the subject of this short note, resembles most closely that in the disease to which I have alluded—osteomalacia.

---

*Reply by Professor GAMGEE, Senior, to GEORGE FLEMING, Esq., F.R.G.S., F.A.S.L., and V.S. King's Own Hussars, on Shoeing of our Cavalry Horses.*

MR FLEMING writes, in the "Veterinarian" for June, taking up warmly some views set forth in Part XIX. of "Our Domestic Animals in Health and Disease," recently issued.

In compliance with requests, I contributed the contents of the Part alluded to, and likewise to the succeeding Part—XX., both of which are devoted to the foot of the horse considered in its healthy and diseased states, and to the art of shoeing.

I therefore, as the sole responsible author of the Part which is the subject of Mr Fleming's criticism, and as that gentleman has shown the good taste of appending his name, instead of the more usual motto to his letter, feel called on to give reply.

Mr Fleming has avoided going much into details, but, after making some general remarks, insinuates that in the work referred to, reflections are cast on the late Professor Coleman's teachings on the practice of shoeing as adopted in the army in particular.

I confess that the charge in both cases, or rather in the twofold case of cause and effect, is rightly due to myself, though



nowhere have I knowingly spoken more favourably on the state of the art of shoeing as performed in civil practice than in the military service. What I meant to say, and have said, and that which will bear repeating, is, that Coleman's crotchets on the foot of the horse, and the art of shoeing, with all their baneful effects, were brought to bear at once throughout the army service, and thence took strong root over the kingdom. Yet it was in the army service of the nation in my early recollections more than forty years ago, that what by courtesy went by the name of Coleman's principles of shoeing was peremptorily enforced.

As matter of course the degrees of good or evil which follow on the application of any prescribed mode of shoeing will always depend on the common sense, manual dexterity, and experience of those who do the work.

Mr Fleming says in reference to the writings by myself, "the author, while treating on the art of shoeing, has felt himself impelled, no doubt with the best of motives, and with a patriotic desire, to be the exposé of what he may consider a national calamity."

Further on, the critical writer says, "Now, it is difficult to make oneself believe that the man who writes in these terms of a most important department of our army can be really sincere," &c.

The writer seems to have changed his opinion as to my motives between the writing the first and second of the above paragraphs. I however beg to inform Mr Fleming that the whole was written with thorough earnestness of purpose, and full knowledge of the questions and subjects discussed.

I by no means intend to be personal, and apply my remarks to the practical application of the art of shoeing by any individual, or in any regiment. On the contrary, in nothing more do I rejoice than to see changes for the better, and constant progress, of which the art stands so much in need, being extemporised and carried into effect by individual members.

As to Mr Fleming's sensitiveness on the exposure of the late Professor Coleman's erroneous teaching, I beg to ask, why should we be mute on the influence of the teaching of a man who has been dead just a quarter of a century, and who had held a monopoly of public offices for nearly a half a century before; and when moreover the career, with subsequent influence of the deceased's teaching, affects the state of the art prejudicially at the present time; the character of a public man of a past generation is fair subject for discussion and the instruction of future generations.

I hold it to be true that it was the late Professor Coleman's influence in the army service, as principal, or Veterinary Surgeon-General, and as sole recognised veterinary teacher in the United Kingdom, with almost absolute power, to place those of his pupils, who were most complying, to the vacant posts as opportunities

occurred. There was nothing to hinder his recommendations being tantamount to orders; and I have known an instance where the colonel of a regiment was much annoyed by having to submit to the dictum that veterinary matters were regulated and determined by other and more competent authority than his. It is a new thing for one who has devoted a long career to the whole subject, to be told of the highly satisfactory and present advanced state of the art of horse-shoeing; or about the success which attends the whole management of their feet. All the evidence shown on the matter goes to prove the opposite thing—viz., that disorders in horses' feet and legs are the evil most complained of by horse owners.

That troop horses are not seen limping along the street like cab horses is no cause for wonder: bought in sound as colts, and allowed ample time to be prepared for their moderate work, which during peace, and on home service, is only moderate exercise, and that given very regularly, what is there to cause lameness directly, though proximate causes tend to that effect?

Reverse the case, go into active and trying service on long marches, and a different tale will be revealed, as was the case in the latter part of the Duke of Wellington's campaign in 1814, when a chief part of, if not one whole regiment, was declared unfit to march from Spain into France, owing to the number of its lame horses; and it was accordingly left behind to do stationary duty. It is our fast ridden and driven horses that feel most where the shoe pinches; and but for the advent of railroads, a quarter of a century ago, it is difficult to conceive how travelling could have been carried on, when it is remembered how many horses were crushed up by the injuries their feet sustained under the combined ordeals which coaching, posting, and bad shoeing combined, inflicted.

Is it matter for surprise, if, as I affirm to be the case, Mr Coleman's notions on the foot of the horse and shoeing were absurd and destructive in their practical tendency and effects? I think it would have been a wonder if the case had been otherwise.

When the mind is brought to reflect on past measures, by men who have a correct notion of the importance of, and great difficulty in the acquirement of, the subjects contemplated, under the title of "Foot and Shoeing," and when, as we are about to do, they carry the thought a little further back, they can but say, truly effects have followed causes.

The late Mr Coleman went at one step, from the calling of a young surgeon, who had, according to the custom of the time, *walked* the London hospitals for two years, and qualified for practice, up to a Professorship of Veterinary Medicine and Surgery. Before proceeding with my narrative, I will state that which is true, viz., that at the present time many undergraduates, at the end of their third session as medical students, could be found in



London and Edinburgh, who through present means and advancements, and the curriculum prescribed, would be incomparably more fitted to take any chair in a veterinary school, or to teach a course of comparative anatomy, than Mr Coleman could have been, from all that the history of his life and long personal acquaintance with him has revealed. Few would know less about horses, and yet what would be said if any sane person were to propose any such young man to take the whole burden of professor of all departments of the art in a veterinary school, as was so inconsistently done in Coleman's case?

If Mr Coleman knew little about horses' feet, he was a good tactician amongst men, so far as immediate and worldly interests were consulted. Again, I repeat, that looking to the early history of Professor Coleman, knowing him in mid career, and following him as a former admiring pupil toward the time of his decease, I cannot discover that he improved from first to last in his teaching and practice on shoeing, or that on the construction, functions, and diseases of the foot. He had compiled a big book at the outset of his career, and followed the bent of early imagination and hastily adopted notions to the end. I understand that Mr Fleming and myself view past influences, and the present state and requirements of the art of farriery, very differently. Mr Fleming's name was unknown to me, until, on reference to the register, I find that he obtained the diploma given under the sanction of the Highland and Agricultural Society in the year 1855. Now, though I appreciate young talent, and know that it is to the infusion of young blood amongst our ranks that we must look for advancement, still, in an inquiry like the present, where age has happily not much impaired strength, or the will to use it, there is some advantage,—the history of our veterinary schools is so short that a single mind may compass the greater parts; and I can but reflect, that having been more than four times as many years as Mr Fleming a member of the profession, and at least five times as long a worker in some of the details of the art, that I should not exchange opinions carefully arrived at without having before me all the proofs necessary to convince.

I feel and allow for the *amour propre* which one devoted to a noble service like that of the army cherishes, apart from professional considerations, which alone are not a trifle; still, though I give way to none for my feeling on those points, I shall neither sacrifice truth nor duty at the expense of the veterinary art and its future usefulness. When I had been twice as long a member of the profession as Mr Fleming has, I still adhered to most of the notions imparted under Coleman's teaching; or at least, was perplexed by them; and had my lot been to have remained within the sound of Bow Bells, instead of being cast early in my career amongst many of the ablest veterinarians in Europe, I can readily

believe that I might have kept on in the beaten track, which though not old had become established.

Should I be called on to descend from generalities to details, I shall do so to the extent of affording the best analysis I am able of every debatable point raised on the subjects above alluded to.

---

*Results of Neurotomy.* By A. J. MURRAY, Professor of Veterinary Surgery in the Royal Agricultural College, Cirencester.

As Neurotomy is occasionally performed in cases of a chronic nature, the history of the following case is valuable, as showing the results which may follow after the diseased parts have been deprived of sensation. On the 23d of March last, a seven-year-old brown horse, which was lame in the near fore-leg, was brought to me for treatment. The history of the case is as follows. The horse having been affected with navicular disease for some time, and the treatment adopted failing to effect a cure, he was unnerved in the beginning of October, and was hunted four weeks after the operation. He was hunted twice a-week and continued to go sound until within four weeks of the time at which he was brought to me. He was observed to go lame after jumping a brook, and after he was taken home the lameness increased instead of diminishing. It was thought, however, that the lameness might be worked off. This system, as might have been expected, rendered it worse, and he was afterwards brought to me for treatment. On examining him I found that the flexor tendons, their theca and the cellular tissue, situated between the skin and other structures, were much thickened and indurated, though to a less extent above than below the seat of the operation. The thickening of the tendons gradually diminished until within two inches of the knee, beyond which the inflammatory action had not extended. He was also unable to flex the coffin joint, which indicated that the flexor pedis perforatus and perforans were adherent at some point. I concluded, from the thickening of tissue which had occurred, that severe injury had been sustained by the tendons below the seat of the operation, and as this, in my opinion, incapacitated the horse for work, I advised that he should be destroyed. The owner desired that he might be submitted to treatment for a week to see what improvement could be effected. This was agreed to. After the horse was put into a loose box, he appeared in great pain, the pulse being much accelerated; he lay down during the greater part of the day, though he had only travelled about four or five miles that morning. A light linen bandage wetted with a lotion

Tinct. Arnicæ, ℥ i.

Aqua, . . . ℥ xii.



was applied from the cornea nearly to the knee, and it may be here mentioned that the temperature of the enlarged parts seemed hardly, if at all increased. By the application of this bandage the pain was abated, so that at the end of four or five days he could stand without suffering, and the pulse had regained its normal standard. On seeing the owner of the horse at the end of the week, I still advised that the animal should be destroyed. This was accordingly done, and the leg affected was afterwards carefully dissected. In the first place, I found the sheath of cellular tissue which covers the shank bone and pasterns, to be very much thickened (in some parts about a quarter of an inch), and indurated. The flexor tendons were also very much thickened as well as the sheath which covers them. On cutting into the synovial theca of the tendons at the back of the fetlock joint, a dark red coloured fluid flowed out, and on cutting through the adhesions which connected the perforatus and perforans, I found that the latter had sustained a rupture about two inches below the fetlock, affecting about half its substance, and the tendon was inflamed at two other points where it adhered to the perforatus. On reaching the navicular joint, I found the tendon adherent to the bone; on cutting through the adhesion, an ulcerated surface about the size of a pea was exposed.

The history of this case is interesting, as it shows the results which may attend the operation of neurotomy when performed on horses which are to be used for fast and severe work. In this case there is little doubt but that the laceration of the tendon resulted from a severe effort, but that great lameness did not occur from this severe injury until inflammation of the tendinous substance had extended above the part where neurotomy was performed. I may also observe that in this case the heel of the neurotomised leg had been severely contused by the shoe of the corresponding hind leg. The nerves were united on both sides of the leg by fibrous tissue, but I had previously ascertained by pricking the pastern with a pin while the animal was alive, that no union had taken place between the nerve fibres. A short time since I had an opportunity of examining a case, in which neurotomy was attended with more favourable results. In this case the subject was a cart-mare affected with ring-bone and side-bone, and the operation completely removed the lameness attendant on these maladies. The nerve fibres afterwards united as sensation was re-established, but the lameness did not again return, and the animal was only destroyed in consequence of old age. As, in the latter case, however, the animal was employed in the slow steady work of a farm, there was much less chance of the operation being followed by unfavourable results.

# EDINBURGH VETERINARY REVIEW

AND

## Annals of Comparative Pathology.

---

### ALLEGED DETERIORATION OF THE HORSES PRODUCED IN RECENT YEARS IN IRELAND.

THE subject of horse breeding, often treated on in our pages, has recently assumed a new phase, in so far as an humble address from the President, Vice-presidents, and Council of the Royal Agricultural Society of Ireland to Her Most Gracious Majesty the Queen, has been received by the First Minister of the Crown; which, with his reply to it, will be found in another part of this Review.

We also reproduce from the "Times" a letter by the Right Hon. Sir Robert Peel to Admiral the Hon. H. Rous, and the reply of the latter gentleman.

As the address to Her Majesty originated amongst men who feel convinced that there is a general falling-off in the number of good and powerful horses in Ireland, so it was met with becoming firmness and excellent judgment on the part of Lord Palmerston, who, while regretting the fact "that good and serviceable horses are becoming more scarce in Ireland than they were some years ago," takes a very different view from the petitioners as to the causes in operation tending to produce such results; and not seeing the expediency of advising Her Majesty to issue a commission of inquiry, shows, with his characteristic firmness, that the equilibrium between supply and demand for horses of the standard of perfection required must be kept up, if at all, by the owners and tenants of the land.

Admiral Rous's letter, it will be seen, which goes more into details than the authoritative document referred to, conveys similar advice to that inculcated by the noble Lord's remarks. The honourable member of the Jockey Club asks for no Government interference, and no other aid from the public purse of the nation than a few thousand pounds more than at present, to be given for the encouragement of breeders and owners of blood



horses, with a view to stir them to emulation in the means adopted to produce and keep stout horses for the turf, by which a large and better supply of stallions would become available for general purposes.

We heartily concur with the noble adviser of the Crown, that in this country, including Ireland, horse-breeding must be left, like sheep-breeding, to the enterprise and taste of those who occupy the land.

Once the question is cleared up, as to whose business it is to look after the production and management of horses, action may be expected to be taken; instead of wasting time in fruitless discussions, only let it be known that Government is about to regulate the matter, and the wheels of the cumbersome machinery would soon be found to clog; the horse-breeding resources, and tastes for the enterprise, are of old traditionary repute throughout this kingdom.

Granting that the means of supply of Ireland, ay, and of England too, are unequal to the demand for good animals, and admitting it to be sound policy to leave to public enterprise the adjustment between demand and supply, is it to be thence inferred that no more thought is required on the matter,—that the State will find horses when it requires them, and every individual who goes to the horse-mart in search of a nag will find one at a price not astounding?

Nothing of the kind. Horse-breeding should be systematically carried on, and demands much knowledge of varied kinds; understanding how to produce the most perfect horses presupposes the knowledge of their whole hygienic management; production and preservation call forth knowledge of a very closely allied kind.

It has already been inferred that much knowledge on the subject, and taste for its application, exists, and we admit the proposition; yet more special knowledge is wanting, and, above all, generalisation of sound, wide-spread principles is an urgent requirement. It should be remembered that the bulk of horses which supply the markets all over Great Britain are bred not by men who keep large studs, but by such as keep from one to three or four mares; and while it may be readily understood that there are many breeders who not only know their own business well, but who could teach others, these form but a small minority, the majority of breeders lack the necessary range of know-

ledge to afford a reasonable prospect of succeeding to the fullest practicable extent. It follows, therefore, that means are required to be adopted for propagating well-established knowledge in reference to that branch of agricultural industry or social science.

It appears to us, that, important as the thorough-bred horse is for giving character to large numbers of the different classes of horses used for common purposes, that there is a tendency at the present time to attach too exclusively all attention to the blood-horse, or, in a word, to stock *versus* its mode of management. The pure-bred horse forms but a fractional part of the number of horses bred ; and as regards the mode of breeding for the turf, that surely forms no model to be recommended for general purposes and adoption either for effect or economy observable. It would be about as rational to send the English, Irish, or Scotch farmer to a stud of blood mares and horses to learn the details of management to be carried out for his rural purposes, as it would be to send one into the green-house to acquire practical knowledge of the way to do the detailed duties in the production of wheat.

The question of blood monopolises undue consideration when that of breeding horses for national requirement is in the balance.

We say give us good stock, and for most purposes blood-horses by all means. But we call equally loud for systematic cultivation of the stock and produce in all stages of existence. It is not necessarily expensive, but proper, management that is required. A large part of the expenditure incurred in producing all classes of horses, above the most neglected and inferior, goes far towards spoiling them, and this is done by men with their eyes open, and not for want of knowledge. Profit at the consumer's expense, for producing a very artificial unserviceable animal, is too much the aim of producers.

Who, then, stand most in need of advice ? Why, the buyers and consumers of horses.

The clever men who breed to sell, and more especially those who buy young colts cheap, and after making them very fat, sell them dear, are not the parties we expect to enlighten.

It appears to us that the standard of perfection in commodities is to a great extent regulated, in every production depending on human skill, by the kind and amount of knowledge on the matter which custom and popular instruction has established.



Whenever remonstrance is made with a man who has kept, fed, and pampered his animal, until it is little adapted for the purpose for which it is destined, the reply given is, that "I do as I think best for my purpose, and those who buy may afterwards do as they think most proper." We see only one line of logic by which the argument of such a man can be met—viz., to leave the animal in his possession, or, if bought at all, at such a reduced price as his deterioration, and the risk to health and long life, should determine. Individual interests alone will be listened to in breeding and making up horses to sell, like as in all other things; and if the sharp looker-out in a horse breeding district can buy a poor farmer's colt for L.50, and, after a few months feeding on long grass and in the fold-yard, sell it for L.100 or L.150, he will continue the course, *because it answers*.

Very cunning people, however, sometimes go beyond the bounds allowable, when they say, "I shall do as I like with my own horse."

If cruelty can be shown to have been committed on an animal, there is a law to meet the case; and if fraud has been had recourse to, if proven, that also could be punished; but unfortunately this last, in the case of feeding and fattening a horse, and then obtaining a price greatly exceeding the worth of the animal, is a question purely for the judgment of those who are parties to the contract. A manufacturer who got up cast-iron razors, and sold them for best steel, could be proved to have cheated; but one who places his horse on a soft surface, feeds him on oil-cake, meal, &c., and makes him fat and sleek, and then sets his price on him, is wholly dependent on the ignorance of some future buyer for a profitable return.

The cruelty alluded to above, however, could be brought home to the possessor of young horses in numerous cases; for instance, when a colt is made big, and to appear four or five years old when he is scarcely three, to make him pass for one of the former ages, in order to realise the price of a horse fit to go to work, a common custom prevails of wrenching out four sound temporary incisor teeth. Sometimes this barbarous practice is adopted twice on the same colt, first at two years old, when the third tooth from the front, on either side of both upper and lower jaw, is extracted, and at the age of three, the four corner teeth, as in the first case. The colt is meant for early sale, and the object in drawing his

teeth is to make him pass for three years old when he is only two ; and in the other case, the three-years-old is made to show for a four or rising five, &c.

In the above cases, which are everywhere to be seen and proven, the colt, in addition to the torture inflicted on him by forcing out four firmly fixed teeth, goes on for months afterwards with a mutilated mouth ; for though the premature removal of the temporary teeth may accelerate the appearance of the permanent set, yet it does so only slightly, as is known also in the case of a child—and the analogy holds good—which falls and knocks out a front tooth, the gap will remain may be from four years old to six or seven before a new tooth fills its place. So with colts in a great measure, though extraction is still constantly done, and town dealers know and encourage the practice, asking the country seller whether the colts' mouths are *well up*. We have pointed out the cruelty, but now, how can it be shown to have connection with fraud ? Why, very readily. A gentleman in want of a pair of horses is willing to give a fair price for good animals ; he is shown a pair of handsome horses, such as, for appearance, meet his approval ; he asks their ages, is told four off, or five, and to the questions as to soundness, and as to their going in harness, these are just to the point, the horses may be seen together in harness, they have probably been driven gently for a dozen times, and then any veterinary surgeon may examine them. They are bought,—and then begin the buyer's trouble, disappointment, and vexations. The young pampered animals cannot stand the ordeals of work and new routine of treatment to which they are subjected, and the gentleman is unable to use his carriage, declares he will job in future, and make a compromise and arrangement to the effect.

Some of these systematic modes of spoiling horses and defrauding buyers require to be seen into. They form part of the system of breeders, and have a direct bearing on the supply of good horses such as are wanted for use, and not for mere show or sale.

If the public decide on making horse-dealers more honest, and breeders rational and humane, these changes will have to be brought about, by every one making himself, as far as possible, acquainted with the subject. All parties would gain, and good horses multiply, under proper management.



## THE CATTLE DISEASES PREVENTION BILL.

AT last we are in a position to congratulate the stockowners of this country, and the veterinary profession, on the attention paid to legislation for the prevention of contagious diseases amongst animals. There is now some prospect of a proper appreciation of the Veterinary Art, by that ever-increasing class of desponding individuals who have considered that the best and the cheapest remedy for malignant plagues was to sell diseased stock to the highest bidder without considering too narrowly what effect such a sale might have on the health of man as well as of animals. A telegram announces, in time for us to pen these few remarks, that the Importation Bill has been abandoned; and, considering that this measure would have placed great restrictions on steam-boat traffic in cattle between the three divisions of the United Kingdom, we are pleased with the resolution of the Committee. Our *cheval de bataille* was the Cattle Diseases Prevention Bill, which has passed through Committee in such a form as to be a useful measure. The schedule of diseases has been changed by the exclusion of the foot-and-mouth disease, and the introduction of the scab in sheep. In one sense, these are both improvements, though, with regard to the foot-and-mouth disease, we believe that too much attention has been paid to the opinions of cattle salesmen and feeders of bullocks, and too little to those of dairy farmers and of the town cowfeeders. This is, however, a trifle in the meantime. Members of Parliament adverse to legislation on the subject of cattle disease, predicted that the Select Committee of the House of Commons would only meet to learn that it was impossible to deal with the question with any hope of success. A veterinary professor who has made himself rather conspicuous by espousing the cause of butchers and salesmen, asserted that we should be privileged indeed if our heads did not ache till the Cattle Disease Prevention Bill became the law of the land. These birds of ill-omen must take another flight; and we venture to assert that they will one day acknowledge the services rendered to this country by those who have devoted much time and anxious study to the means whereby the destructive plagues of animals may be kept in check, and, possibly, so far as these Isles are concerned, exterminated, as they

were just one hundred years ago. We refrain from further comment, until the opportunity is afforded us of furnishing our readers with a complete digest of the evidence taken before the Select Committee of the House of Commons. In that evidence, there is much to amuse, but far more to instruct; and we wish there had been less of the doctor-differing element, which can only tend to weaken the position of scientific men in the eyes of the world.

---

### RACING AS AN INCENTIVE TO THE PROMOTION OF THE BREED OF THE HIGHEST CLASS OF HORSE.

IN the last number of the "Review," when making some remarks on the then recently run race for the Derby, headed as above, we made a mistake, which having been pointed out, we take the earliest opportunity of correcting. At page 342 it is stated:—"Yesterday, on Epsom Downs, the best possible answer was given to those who assert that racing and a fine breed of horses is not appreciated by the Scottish aristocracy and men of business. The winners, Blair-Athole, General Peel, and Scottish Chief, all belong to Scottish owners, and were trained by Scotchmen." We now learn that Mr I'Anson, the owner and trainer of the Derby winner, is not Scotch, but a native of England; and though early in life he was much in Scotland, came north already initiated in the English school of training and managing race-horses.

---

### MEAT INSPECTION.

THE details of a prosecution for the sale of diseased meat appear in the following pages, and in drawing attention to them, we wish to impress on the members of our profession the importance of devoting some time and attention to duties which must henceforward become more onerous and better appreciated. Some may think that the inspection of meat is justly entrusted to persons who are not above dirty work, and a professional man may deem it beneath him to examine and judge carcasses of animals dressed for human food. We entertain a different opinion; as the difficulties attendant on the investigation of disease with a view to determine its effects on animals to be



eaten, can only be grappled with by well-educated and skilful pathologists. Many circumstances arise in connection with the inspection of provisions of all kinds, which show that there is great danger in entrusting such work to inexperienced, uneducated, and wavering men. Honesty and knowledge are the requirements, and the one without the other, whichever it may be, can only lead to disgrace and imposition on the public.

If we make these remarks in connection with the case which occurred recently at Leith, it is because affairs are now in a transition state, and municipal authorities scarcely know how to deal with those who traffic in diseased meat. A butcher exposes for sale the quarters of no less than three diseased animals. A policeman seizes portions of each of the three carcasses, and owing to the absence of any qualified inspector, whose opinion should be final, many witnesses have to be called for the prosecution, and the defendant succeeds in finding not a few to aid him in his wretched cause. So loose is the examination of the meat, that the majority have not ascertained, and are quite ignorant of the fact, whether the quarters seized belong to two or three animals. Professor Dick occupied himself with cutting into the meat, and eating portions of it raw. What a precedent! If every meat inspector is to act as taster, and perform as many experiments on himself, as he has carcasses to examine, the office will go a-begging. That Professor Dick was not poisoned proves nothing; and it must be remembered that the public desire and demand protection from the sale of diseased meat of all kinds; and though in practice we may find it expedient to permit some animals injured, or slightly diseased, to be sold as human food, an inspector is at all times justified in condemning a carcasse in which there are obvious signs of morbid change. He is especially justified in so doing when animals have been slaughtered in an irregular manner, and all the internal organs have been thrown away. There are few maladies in which the pathological changes of the flesh are recognised at any time and under any circumstances, as in parasitic disorders of the muscular apparatus. In all other diseases of animals, when the entrails have been destroyed, or somehow kept out of sight, we must trust to the examination of meat and judge from colour, consistence, leanness, juiciness, and the like physical characters, which are by no means reliable signs of any special disease.

An inspector—especially if having reasonable cause to suspect that any butcher is trading in diseased animals—is well armed for a prosecution if meat is black, lean, flaccid, and especially if putrid. He need not deal with the previous history of the animal whose carcass he has seized, and he is not called upon to prove that human beings would be poisoned if such stuff were sold them. Many persons buy meat who know nothing of the characters indicating its unsoundness, and others are often driven to spend their trifle for a Sunday's dinner late on a Saturday night, when by gas-light bad colour is not easily detected. Under these circumstances, the trader in diseased meat realises great profits, and such wholesale frauds call loudly for exposure and punishment. The fact that much diseased meat is necessarily very innutritious, indicates how, without demonstrating its poisonous properties, we are justified in condemning it.

It is obvious that veterinarians can diminish the traffic in diseased meat chiefly by being called upon to prevent disease; and it is in this way that pending legislation is to benefit the public and our own profession. We do not want to occupy ourselves so much with animals after death as with these animals during life; and we assert that satisfactory meat inspection must include examination before and after slaughter. There are many topics of interest to be discussed on this subject; and it is very desirable that some definite rules be laid down to guide veterinarians in the performance of work for which they have hitherto not been trained. It is, of course, easy to inspect very good and very bad carcasses; but there are good-looking bodies of diseased animals which should be condemned, and *vice versa*. All this must be overcome by practice, and that alone can enable us to establish rules which have as yet never been framed for the guidance of professional men. There are in various large towns public slaughter-houses, and it is there that every opportunity should be afforded for the instruction of those who must be initiated in the new art. It is a new art, and meat-inspectors for the past, whether butchers, policemen, or professional men, have not based their operations on an adequate amount of knowledge to inspire them with courage and confidence. Nothing is more detrimental to a person in any official position than to hesitate and yield from ignorance of his special duties. If veterinary surgeons are to be employed henceforward, let them and others remember that a



certain time to gain experience is needed for the better instructed professional man, as it is for the inspector chosen at random, principally because he has been a man of no occupation, and needed an income.

The last number of Virchow's *Archives* proves more and more how actively on the search we should be for the flesh of animals affected with parasitic maladies. How few veterinarians know what is meant by the measles of swine in this country? How few have even heard of trichinæ? It has been asserted in the medical periodicals of this and other countries lately, that many animals, and especially pigs, should not be permitted to leave a slaughterhouse without a microscopic examination of the muscular system. Considering that a few minutes' work suffices to satisfy one of the absence or existence of so deadly a parasite as trichina, we should not grudge the work which the scheme in question entails. Unfortunately, nothing short of a microscopic examination is of any service, and there are undoubtedly many cases in which a scientific meat-inspector may not only avail himself of lenses, but also of chemical tests. Knowing, as we do, how "physicked" meat finds its way to the butcher's stall, we cannot but recommend the adoption of all means at our disposal to ascertain the truth. We have seen veterinarians abroad boil and roast suspected meat, and in the elevation of temperature an offensive smell sometimes indicated that the flesh was tainted with an organic poison. In one instance a carcass was detected which was highly charged with croton oil. Examples of this kind might be adduced in great number, but without entering into further details, we may close with the earnest recommendation to all veterinarians, to acquire skill and dexterity in examining dead as well as living animals.

**MEETING OF SOCIETY.**

—o—

## THE LANCASHIRE VETERINARY MEDICAL ASSOCIATION.

## SECRETARY'S OFFICIAL REPORT.

THE members of the above association held their seventh meeting at the Brunswick Hotel, Manchester, on the first of June. The following are the names of members and visitors present:—

Mr Gould, Irlamsoth Height; Mr Nuttall, Rawtenstall; Mr Brooks, Pilkington; Mr Greaves, Altrincham; Mr Darwell, Knutsford; Mr Litt, Shrewsbury; Mr Cartwright, Whitchurch; Mr Dunn, Tarporley; Mr P. Taylor, Manchester; Mr Haycock, Manchester; Mr Dixon, Manchester; Mr Fleming, F.R.G.S., F.A.S.L., V.S., King's Own Hussars; Mr A. Challinor, Pendlebury; Mr W. Challinor; Pendlebury; Mr J. Taylor, Oldham; Mr Morgan, Liverpool; Mr T. Taylor, Manchester; Mr R. Hampson, Manchester; Mr T. Greaves, Manchester.

At the conclusion of the private business of the Association, which included the election and nomination of eight fresh members. Mr Haycock read his paper on Pleuro-pneumonia, the discussion of which was very lengthened and interesting. Inoculation was severely attacked by some members of the Association, and was ably defended by Mr Cartwright of Whitchurch and Mr Dunn of Tarporley; these gentlemen having used it repeatedly, spoke in good terms of its beneficial results. A great deal was said respecting the contagious nature of the disease, and many different opinions were given. Upon this subject Mr Litt of Shrewsbury gave some capital ideas. Mr Fleming and Mr P. Taylor also expressed their opinions upon the point; but, upon the whole, no decided success resulted from this portion of the discussion—one party believed it to be contagious, and another contended that it is non-contagious. The treatment of the disease was another stumbling-block in the discussion,—every practitioner having his own particular fancy, and thinking that the one he practised was the best. All kinds of remedies were adduced as beneficial in this disease, but with no decided success. The essayist, upon summing up the different opinions given, remarked that he had treated cases in all manner of ways, and with all classes of medicine, with still the same uncertain success; his opinion was, that the great secret lay in giving good food and nourishment, and if this did not succeed, destroy the animal. The discussion continued up to past ten o'clock, when a vote of thanks having been proposed to the essayist for his valuable paper. Mr Greaves, the president, announced that at the next meeting Mr Lawson of Manchester would read a paper on Tetanus. A vote of thanks having been given to the president, the meeting terminated.

THOS. TAYLOR, *Hon. Sec.*



## VETERINARY JURISPRUDENCE.

—o—

## CONVICTION FOR SELLING DISEASED MEAT.

## LEITH POLICE COURT.

At the Leith Police Court, on the 24th ult.—Bailie M'Kinlay and Bailie Watt on the bench—Thomas Ancrum, flesher, Junction Road, was charged with a contravention of the Leith Police Act, by having exposed for sale, in a booth in the Fleshmarket, 230 lbs. or thereby of meat, which was unfit for human food. The accused pled not guilty, and the case went to trial. He was defended by Mr James Bell, S.S.C. Mr Grant conducted the prosecution.

The first witness examined was a sergeant of the police, who deponed that, on the evening of Friday last, he found in Mr Ancrum's booth in the Fleshmarket, three fore-quarters of beef, amounting in all to about 230 lbs., which, from its appearance, he deemed of a character unfit for human food. It was dark in the colour, and one of the pieces had a bad smell. He seized the beef, and afterwards showed it to Mr Ferguson, flesher, Dr Littlejohn, surgeon of police, and Professor Gamgee. It was shown to Dr Littlejohn on the following day, to Mr Ferguson on the Monday, and to Professor Gamgee on Wednesday.

Mr Ferguson, flesher, stated that he had examined the beef on Monday, and it was then in a most disgraceful state. It had not been good for a considerable time, nor could it have been good before it was killed. It was disgraceful stuff to be offered to the public,—shamefully lean and dark in colour. In cross-examination, witness admitted that except its very dark colour, and its exceeding leanness, he did not know what was the matter with the beef, nor did he know what peculiar disease had brought it to the state in which it was offered for sale. The flesh belonging to one of the beasts must have had lung-disease within a month. He had never before seen such flesh offered to the public; it was positively flesh without substance. Could not say what was particularly wrong with the beef, but it appeared to him uncommonly like the flesh of a worn-out old man or woman. (Laughter.) It was so bad when he saw it, that he did not think that even time could make it worse. (Renewed laughter.)

James Hamilton, flesher, said that he had seen the meat in the market on Saturday. It looked very bad, was lean, and dark in the colour. It was unmarketable beef, and he would not sell such stuff. He had examined it more minutely in the police premises, and there also it seemed very bad beef, and quite unmarketable. In cross-examination, witness admitted that he did not know of what disease the beast had been ailing. He had not

cut into the flesh ; indeed he did not care about touching it. It contained maggots below the "skirt." His opinion was that the meat was unfit for human food. It was lean, dry, and without substance.

By the COURT.—Examining it as a practical butcher, do you consider the beef was marketable ?—I do not.

George D. Tait, flesher, Leith, deponed—I examined the three pieces of beef on Saturday afternoon, and found them to be of the most inferior quality and very lean. The ribs had been entirely skinned over, and the flesh gave evidence of having had some internal disease. Very often a piece was taken back from the bone, but on this occasion it was entirely skinned over.

Cross-examined by Mr BELL.—I have been a butcher for a good many years. Interrogated—Did you carry a basket when you was a boy ?

The COURT.—We object to that question. We know that Mr Tait is a respectable butcher.

Dr Paterson, Leith, deponed.—I examined the meat, and found that it was very lean and dark in the colour. Distinct indications were present of its having been diseased, and decomposition had set in. The meat must have been diseased before the animal was killed, and I am of opinion it was quite unfit for human food. Cross-examined.—The disease was quite distinct. A butcher must have looked at it very cursorily if he did not find out the disease ; but I question if butchers are very good judges of disease. A butcher of twenty or thirty years standing may be a good judge of meat and an indifferent judge of disease. The pleura in the pieces he examined was very awkwardly removed, and the membrane was scraped from the ribs. I cannot, of course, say positively what a butcher knows, or what he does not know, concerning disease.

Dr Littlejohn, medical officer for the city of Edinburgh, deponed.—I examined the meat on Saturday afternoon. It was very dark in colour, soft, poor, and one of the pieces gave slight evidence of disease ; but it was difficult to make it out, as the pleura had been skilfully removed in the dressing of the carcass. The meat was not, in his opinion, fit for human food. Cross-examined.—The dark colour and softness of the flesh were the principal evidences of the disease ; but, as I before stated, it was not easily detected, from the neat manner in which the carcass had been dressed. Small portions of the pleura had not, however, been removed from the carcass, and in these places there were distinct traces of pleura. I am quite certain that diseased portions had been removed from the beef, but I am not prepared to say of what the beast died. The beef had, doubtless, been deteriorated when I saw it, by being tossed about on a barrow ; but I have no hesitation in saying, that for a considerable time before I saw it, the meat was unfit for human food.



There were traces of inflammation in the parts of the pleura not removed. I could not say whether a butcher would at once have detected the presence of disease. The whole of the pleura, with very slight exceptions, had been very carefully removed. I cut into the flesh below the shoulder, and it presented the same appearance of softness, darkness, and disease. The beast might have died from suffocation, but I am quite certain the flesh was unfit for human food.

By the COURT.—I have no hesitation at all in saying it was unfit for human food.

Professor Gamgee, who was the next witness examined, deponed, I examined the meat in question on the previous day (Wednesday). The pieces were parts of three different animals. The meat was lean, thin, and flaccid; it had undergone various changes during the last few days. I cut into one of the best parts, and found it was what was popularly known as a “wet carcass.” The marks of disease had been removed, but traces were distinctly visible. There was a turgid condition not only of the flesh but of the bones. The spinal bones were smashed, as if the beast had not been neatly slaughtered. It is clearly my opinion that the beef was unfit for human food. Cross-examined.—The meat, in my opinion, should never have been exposed in any shop or market. It was, as I have already said, quite unfit for human food. Interrogated by Mr BELL—Is not this a pet subject of yours, Professor? I cannot say that it is a “pet” subject. Do not many very eminent men differ from you in your opinions regarding cattle disease? I cannot say that many very eminent men differ from me on that question, and I know that few eminent men in my own profession differ from me. Did not Mr Hall Maxwell, in the House of Commons recently, refute almost every statement you have made regarding the statistics of cattle disease? Mr Maxwell differed from me, but did not refute my statements. I have no doubt whatever that the meat I examined yesterday was the flesh of three different animals, as there were three distinct spinal cords. The meat was shrunken, and its nutriment had disappeared. There were unmistakeable evidences of pleura in two of the carcasses, although they had been “cooked” in the slaughter-house. Do not people sometimes make mistakes in such examinations, and may not you have been mistaken? I am certainly not infallible; but having cut through various parts of the beef, I am pretty certain that I am correct in my estimate of its quality. I cut through the muscles, and have no doubt, from the examination I made, that the meat had been very bad for fifty-six hours before I saw it.

Robertson Wylie, superintendent of the Leith Slaughter-House, deponed, that Ancrum had only slaughtered one cow in the slaughter-house since the beginning of the month.

For the defence, a butcher, named Kennoway, stated that on

the 9th ult. he had killed a beast for Mr Ancrum. It was passed by the inspector and taken to Mr Ancrum's shop. One of the pieces seized was a fore-quarter of that animal.

Professor Dick, interrogated by Mr BELL.—Did you inspect the three pieces of beef referred to in the Police Office on Saturday? I examined them most minutely. Were they parts of two or three animals? They were parts of only two animals. Did you taste the meat? I tasted all the pieces raw, and found each of them very good. One of the pieces had been long killed, but although it was lean and thin, it was quite sweet; and none of the pieces had the least sign of disease. The pleura on the ribs was quite healthy, and I am quite certain there was no putrefaction about any of the pieces when I saw them. Do you consider the meat was fit for human food? I consider that it was perfectly marketable, and fit for human food. Cross-examined by Mr GRANT.—Were the pieces parts of two or of three animals? I believe them to have been the parts of only two animals. I certainly did not examine very minutely as to this, but I think it was the flesh of only two animals. Were they not dark in colour? One of the pieces was dark, but that arose from the length of time that had elapsed since it had been killed. Did you not find traces of disease? I did not find any traces of disease; I examined the pieces sufficiently to satisfy myself that pleura did not exist in any one of them. The surface next the lungs was perfectly clean; none of the carcasses had been tampered with; and the ribs had not been skinned.

John Duff, Robert Plummer, and David Dods, all fleshers in Edinburgh, deponed that they had made a careful examination of the pieces, and found not the slightest trace of disease. Duff had tasted the beef, but found nothing wrong with it; it was quite wholesome. Plummer had been a flesher nearly fifty years, and could tell at once whether meat had pleura. The only thing wrong with the beef when he saw it was, that it had been kept too long. Dods also knew pleura at once, but the pieces he examined had no traces of disease, and he would readily have eaten parts of any one of them.

A butcher named M'Millan was next examined. He had seen the beast to which two of the quarters belonged slaughtered, and after having made a careful examination, found that it was not diseased, although it was lean. He was quite sure the three pieces were parts of only two animals. In cross-examination, the witness stated that the beast had been killed at the farmstead of a Mr Somerville, in the vicinity of Winchburgh. The animal had been brought from an adjoining farm. It was a milch cow.

When the evidence was concluded, Mr GRANT asked the Magistrates for a conviction. Three respectable butchers had given their opinion that the meat was unmarketable, that it was dark, lean, shrivelled, and soft. When pressed about their know-



ledge of what particular disease the animals had died, they could not, of course, give very decided opinions ; but when such men as Professor Gamgee, Dr Littlejohn, and Dr Paterson, had gone so minutely into the case, and all came to the same conclusion regarding the unwholesome state of the meat, there could be no doubt, he (Mr Grant) thought, that their Honours would record a conviction against the accused. Professor Dick's examination of the three pieces of meat must have been of the most superficial character, when he found that they belonged to two animals only, because Professor Gamgee had made a most minute examination, and found three spinal cords, satisfactory evidence that they were parts of three different animals.

Mr BELL afterwards addressed the Court, and at some length referred to the great difference in the evidence of the professional gentlemen. He dwelt more especially on the evidence of Dr Littlejohn and Professor Gamgee. Dr Littlejohn had said that the traces of pleura had been skilfully and neatly removed, and that the carcass had been cleverly dressed ; while Professor Gamgee had stated most decidedly that the traces of disease were distinct, and that the carcass had been slovenly dressed. He put it to the good sense of the magistrates whether the evidence of a skilled practitioner like Professor Dick was not of infinitely greater weight than Mr Gamgee's professional theories. The butchers who had been examined for the prosecution, he contended, could only reiterate that the beef was bad, without assigning any cause ; while those for the defence had made most minute examination, and found that, although the beef was lean, it was quite wholesome.

Bailie M'KINLAY, in giving judgment, said that his brother magistrate and himself were quite satisfied that the case had been proven, and their decision was that Ancrum be fined in the sum of L.10, or go forty days to prison.

Mr BELL craved their Honours to mitigate the sentence, seeing that there had been so much difference in the evidence.

Bailie WATT said he was sorry that a person like Mr Ancrum, holding a respectable position, should lend himself to such a suspicious mode of dealing as that which had been brought out, viz.—the going to farm-houses, buying diseased carcasses, and bringing them to Leith, without having been inspected. To say the least of it, this method of dealing looked very suspicious.

Bailie M'KINLAY concurred with Bailie Watt, and stated that, however well the case had been conducted by Mr Bell, they were determined to carry out the letter of the law. The fine could not be mitigated. The magistrates of Leith had been at great expense in erecting suitable abattoirs for the accommodation of the fleshers, and it would not be consistent with their duty as magistrates if they allowed meat to be brought surreptitiously into market.

The fine was paid, and the proceedings terminated.

## PERISCOPE.

—o—

## THE LEPORIDE.

*(From the Journal of the Royal Agricultural Society of England.)*

BOTH the farmer, who is more and more conversant with cross-breeding, and the naturalist, who cannot stand apart from the existing controversies on "species," are interested in the practical development given in France of late to a race of hybrids between the hare and the rabbit, which bears the name of "Leporide." This half-bred has been reared during the last seventeen years under the management of M. Roux, President or Vice-President of the Agricultural Society of Charente, who appears to be an intelligent but unscientific and unobtrusive landed proprietor. Its fame has been spread abroad by M. P. Broca, a French naturalist, in a treatise on Hybridising, published in 1859, who twice visited and inspected M. Roux's establishment, and carefully weighed his explanations.

It appears that among the recognised hybrid animals are found (in addition to the mule) the offspring of the he goat and the ewe; of the setter-dog and the bitch-wolf (of which breed four generations were reared by Buffon); of the camel and dromedary; Buffon's crosses between the ox, bison, and zebra; and those also obtained by John Hunter from dogs, jackals, and wolves.

Moreover instances have been already recognised of a hybrid birth from the hare and rabbit: between 1773 and 1780 the Abbé Gagliari, near Oneglia, bred from the *buck-rabbit* and the *doe-hare*, and Amorretti recorded the results in 1780. In 1831 the London Zoological Society received a communication relating to the chance birth of a hybrid from the buck-hare and doe-rabbit.

In this case a leveret had been reared with two young rabbits, buck and doe. The doe bore a litter of six young ones, of which three were common rabbits, and the other three resembled the hare. One of the latter alone survived, and some years after was dissected by Professor R. Owen, whose examination settled the previously existing doubts as to the hare having been its sire. Its intestines, it is said, corresponded neither with those of the rabbit nor the hare; the great bowel differed but little from that of the rabbit, the smaller one was that of the hare. The skin resembled that of the hare, but the hind limbs were like those of a rabbit, and the flesh was white. Owen recognised it as a hybrid.

That hybrids may be produced between these two animals seems not to be disputed; but that hybrids should be prolific and breed one with the other, or with either parent stock, has been a point of acrimonious contention, which is not the less bitter because it is prompted by a motive to which respect is due.

It has been a dogma of the Naturalists that hybrids of different species are sterile, and the hare and rabbit are classed as belonging to different species; moreover, points of religious belief have got mixed up with the Naturalists' creed respecting "species." So M. Roux and his reporters have been libellously assailed, and the truth of their assertions tested, and, as it seems confirmed.

M. Roux's object in his cross-breeding was to unite with the prolific character of the rabbit some of the superior qualities of the hare. With this view the doe rabbit was at first preferred (the doe-hare being a very shy breeder in confinement, besides being less prolific), and further modifications in the race were afterwards introduced. The first cross very nearly resembled the rabbit; the females among them were then put to the buck-hare, and their produce were "larger and stronger than either father or mother," yet in appearance they were only half way between the hare and rabbit. M. Roux next bred from this second generation ("*inter se*"), and the offspring resembled their parents, but the litters diminished in number down to from two to five; so a little more rabbit blood was thought desirable, and the does, three-quarter hare, were put



to a half-bred buck. The result was quite satisfactory—the produce exhibited the handsome features and form of their mother, and they were prolific. When they were further bred from “*inter se*,” the litters numbered from five to eight, and they were more hardy even than the rabbit, and easily reared: they grow fast, are precocious, and will begin to breed at four months. The gestation occupies thirty days; they suckle for three weeks: twenty-seven days after the last birth the doe may be put to the buck, and can very well rear six litters in a year.

It is stated that this breed supplies a large amount of meat for the food consumed; sold at the age of four months they make two francs in the market, when the warren-rabbit fetches only one franc. When older their skin becomes more valuable than that of the hare, and commonly sells for one franc. At a year old they generally weigh from 8 to 11 lbs.; picked specimens have attained to 12, 14, and even 17 lbs. With results such as these, M. Roux considered that he had reached his aim, and this new stamp of animal was to be retained and maintained.

To breed these animals the following course must be pursued: a leveret should be caught between twenty and thirty days old, when he can live without being suckled; he should be kept with some young doe-rabbits of his own age, quite apart from any other animals: he will grow up with them, but continue to be more shy than they. When they are of an age to breed, all the does, except one or two, should be withdrawn, and shortly these will be with young; they may then be removed and some of the others brought back. The hare will after this be generally kept by himself, and the doe will be brought to him at night, when all is quiet, and a covering will be put over the bars of his hutch.

It appears that the number of the young at a birth depends on the sire as well as on the dam: a doe-rabbit put to a hare, instead of rabbit, will bring forth five to eight, instead of eight to twelve young ones; and again, as already stated, a buck hybrid of half-rabbit blood increased the numbers of the quad-roon litter. This stock has now been kept up through some fourteen or fifteen generations, and in consequence of the pains which have been taken to avoid too much of breeding “in and in,” they have not fallen off in size or appearance.

M. Broca speaks of M. Roux as a gentleman who has no pretensions whatever to scientific knowledge, and yet reports that his whole account of the course of events tallies exactly with that which an enlightened physiologist, familiar with the laws of “*Hybridity*,” would have anticipated under the circumstances; and this he considers to be in itself strong evidence of the truth and accuracy of his statements.

If our readers who are breeders of stock, have had patience to proceed thus far, a word may suffice to point out to them that, whatever be their flock or herd, they have a personal interest in the broader features of this subject. Extreme cases are best qualified to throw a light upon the mysteries of cross-breeding, and to aid the investigations of the “laws of hybridity.” The less the affinity, the broader the contrasts between the two parents, the more manifest and distinct will be the part which each plays in moulding the nature of the offspring.

The hare and the rabbit are so little akin, that the idea of any fusion between them has been a stumbling-block to orthodox science. If we are satisfied that both the buck-rabbit and doe-hare, and also the buck-hare and doe-rabbit, have been successfully brought together, either of these two phases will be worthy of examination, and the one will illustrate the other. M. Roux’s hybrids of different degrees, originating with the doe-rabbit, have all had white flesh, like that of the rabbit in colour, though different in flavour (Gagliari’s, bred from the doe-hare, had red meat); their coat is said to resemble the hare in its texture, but its colour is intermediate, a reddish grey; the ears are as long as those of the hare, with this peculiarity, that in many instances one ear is erect, the other pendent; their heads are larger than those of the rabbit, the eye more prominent and placed nearer to the nostrils; the hind-legs are said to

resemble the hare (Professor Owen's report, as we have seen, differed in this respect), the fore-legs are longer ; the length of tail is intermediate. The rabbit-blood, through the male or female alike, appears to give and maintain a prolific character, that of the hare to impair it.

From such considerations M. Broca has been led to adopt a distinction in the physical constitution, suggested by Bichat, between the relative (or animal) life and the organic (or vegetative) life, and to consider that in hybrids the former is chiefly influenced by the sire, the latter by the dam. The expression, "*relative life*," seems intended to signify all that tends to bring the animal into *relation* with external objects—the organs or instruments of perception, will, locomotion, sensation ; whilst on the *organic life* depend digestion, secretion, nutrition : that is to say, the formation of tissues through the blood in like manner as wood is formed by sap, whence organic is nearly synonymous with vegetative life.

One illustration of the use to which such curiosities of physiology may be put by farmers may serve as a fitting conclusion to this statement. We have lately had before our eyes an interesting lecture on the breeding and management of sheep, from Mr Woods, agent to Lord Walsingham. The practical aim of this address is especially manifested by the special notice it directs to cross-breeding, as generally practised in Norfolk, rather than of the management of his lordship's first-rate Southdown flock.

Mr Woods raises the question, whether farmers should not rather put a down-ram to long-woolled ewes than continue to follow the converse practice. Now, if the flesh distinctly takes after the dam, and "the consistence of the pelt" be that of the sire, it would seem that we should lose rather than gain by the change suggested. So far as quality of flesh is concerned, the down-ewe is decidedly preferable, for the butcher values dark meat, particularly in young animals ; so far as perception, and will, and sensation influence the temperament, a placid long-woolled sire will answer best. With respect to the wool, there may be a doubt whether we should refer its character to the sire or to the dam ; yet this theory appears to support the preference given to the sire bearing a heavy fleece. At all events, breeders may get some food for meditation from the records of Cagliari's and Roux's respective forms of hybrids.

---

## POISONING BY COTTON-CAKE.

(From the Journal of the Royal Agricultural Society of England.)

PROFESSOR VOELCKER says:—Decorticated cotton-cake, which is only made in America, is now seldom seen in the market, and its place is now taken almost entirely by whole seed-cake of English make. In former years, cases of so-called poisoning with cotton-cake were frequently brought under my notice ; in the past season only three or four instances of the injurious effects from its use were referred to me : from this it may be inferred that English cotton-cake is now generally sold in a better condition than formerly. This, indeed, is the case. Having failed to detect an essentially poisonous matter in any of the cotton-cakes, which, nevertheless, unquestionably had an injurious, and, in many cases, fatal effect upon the animals to which they were given, I looked closely into this matter, and learned that the injury to cattle was produced by the hard, indigestible, and badly comminuted husk. My suggestion to remove a portion of the coarser husk by screening, and to reduce the remainder into a tolerably fine powder, has been adopted by several makers, who have thus removed the chief defects that characterise all cakes in which the husk may be seen in large fragments. Inferior cake has always a brownish colour, instead of a more greenish-yellow appearance.



## ON REGULATING THE SEX OF THE OFFSPRING OF ANIMALS.

*(From the Journal of the Royal Agricultural Society of England.)*

IF there be any device for regulating the sex of the offspring of our flocks and herds, every breeder is interested in knowing it; even if a hint can be given which only improves his chance, without costing much trouble, it still is a boon.

It would seem from the following testimonial that Professor Thury of Geneva had got some insight into one of the factors which enter into this complicated and mysterious problem:—

“I, G. Cornaz, manager of the property of my deceased father, M. A. Cornaz, late President of the Agricultural Society of Roman Switzerland at Montet, Canton de Vaud, hereby certify that I received from M. Thury, Feb. 18, 1861, a paper containing confidential instructions for the purpose of making a practical experiment to ascertain the law which regulates the sex of the offspring of animals.

“I have applied these directions to my herd of cows, and have obtained at once, without any tentative trial, the desired results.

“In the first instance, in twenty-two successive cases, I endeavoured to obtain heifer-calves. My cows were Swiss, and my bull a pure Durham. Heifer calves were, therefore, in request—bull calves only fit for the butcher; *in every instance I obtained the desired result.*

“Later, when I had bought a pure-bred Durham cow, I was anxious to breed a bull to take the place of the one which I had bought at a large price. Again I acted according to Professor Thury’s directions, which are ready of application, and again I was successful.

“Besides my Durham bull, I designedly bred six half-bred oxen for the plough from cows selected for their colour and size. My herd comprised forty cows of all ages.

“On the whole, I have tried the new directions twenty-nine times, and in each case obtained the desired result, male or female; I have had no instance of failure. I personally watched each trial. I can, consequently, declare that I consider Professor Thury’s system to be real and certain, and I hope that all breeders will speedily profit by it.

“Drawn up at Montet, February 10, 1863.

(Signed) “G. CORNAZ.”

We may learn from a pamphlet of Professor Thury, “On the Law which regulates the Sex of Plants and Animals,” what is his scientific theory, and what are the practical directions which he deduces from it.

The following statement is a brief summary of his views. Starting with the vegetable kingdom, Professor Thury adopts the theory of Knight, who, in concert with Wolff, De Candolle, and Robert Brown, considered stamens and pistils to be fundamentally identical (both being modifications of the leaf), and further regarded the production of the male organ in plants as due to greater maturity or more perfect development.

Considering how general the laws of Nature are, the Professor infers that the propagation of animals follows an analogous course. He states that it has already been admitted that for certain oviparous animals the last hatchings produce males; that Huber recognised as fact that early fecundation produces female bees, and *vice versa*; and so from one step to another he arrives at the conclusion that an egg yet unimpregnated, is female during the first part of its passage down to the matrix, and male in the last part. The sex, then, of the creature will depend on the degree to which the egg is matured at the moment of fecundation. He therefore considers it to be a general law that fecundation which follows shortly after “heat,” or menstruation, breeds female offspring, and *vice versa*.

The following are his directions and cautions:—

1. The peculiarities of different cows should be observed and taken into account. The number of hours during which they take the bull varies from twenty-four to forty-eight. To obtain a heifer, the first part of this period is selected; for a bull-calf, the latter part.

Exceptional animals, such as are fat or tied-up, afford no fair criterion; but healthy, well-conditioned specimens, living in the open air, should be selected for experiment.

---

These views must only be taken for what they are worth; so far as the result depends on the mother, and she is a fair representative of her sex, the hint may be serviceable; but that the sex of the offspring is quite independent of the sire, as is here assumed, is a doctrine which will not pass unchallenged.

I will conclude this notice by an extract from a letter addressed to me on this subject by Professor Wilson:—

“It is very desirable that these principles should be properly tested on a sufficiently large scale, and by reliable persons who would themselves take care that the advice given should be correctly followed. A few years’ experience would then enable us to determine whether M. Thury’s deductions are valid as a law.”

---

## THE ALLEGED DETERIORATION IN THE IRISH BREED OF HORSES.

WE have been favoured with the following correspondence between Sir R. Peel and Admiral Rous on this interesting subject:—

“Whitehall, June 3.

“MY DEAR ADMIRAL,—Pray excuse my troubling you, as a Steward of the Jockey Club, and most deservedly one of the highest authorities upon all questions affecting the character and quality of thorough-bred stock in the country, with certain inquiries with a view to elicit an opinion from you as to the breeding of horses for racing purposes in Ireland, to which your attention has no doubt been directed, from the especial notice this subject has of late attracted in the eyes of the principal supporters and patrons of the turf in that country.

“That the breed of horses in Ireland has deteriorated is alleged to be an acknowledged fact, owing to the carelessness with regard to brood mares likely to produce superior stock, and to the dearth of good stallions, and it is a complaint that Queen’s Plates in Ireland are all won by English horses, while handicapping is put forward as a very bad principle in racing, and the great cause of the bad class of horses being now bred; and it is urged that if, as formerly, in competition for Royal Plates in four mile heats, four-year-old horses carried 10st. 4lb., with a proportionate increase of weight for old horses, a great inducement would be given to breed and to keep horses of size and substance, and thus to bring up our horses to that point of excellence which once made them the envy of Europe.

“Since 1674 or ’5, Royal Plates have been run for on the Curragh; and so great was the interest attached to the encouragement to be given for the further improvement of fine breeds, that it was proposed by Sir William Temple that, ‘for the honour of the winning horses, the Lord-Lieutenant or his deputy should attend with two judges of the field to decide all controversies, and with the sound of the trumpet to declare the winning horses (two plates being run for at the same meeting), the jockeys of which were permitted to ride from the field with the Lord-Lieutenant, and dine with him on that day, and there receive all the honours of the table.’ The Irish Government is now intrusted by the Treasury with the annual sum of nearly L.1600 for fifteen Queen’s Plates, to be run for in Ireland, and it rests with the Government to determine the weights and distance for Her Majesty’s Plate, to be duly reported to the Treasury in an official return of the special application of the fund; and I would



more particularly inquire of you whether you could suggest any alteration in the present customary regulations, with which you are familiar, for competition for these Plates; and, moreover, as the point has been raised, I would put it to you, although I do not suppose such a limitation would meet with your approval, whether you consider it advisable or expedient to limit the entries for Queen's Plates in Ireland to Irish-bred horses. The whole subject may be expected to give rise to debate in the House of Commons upon Class II. of the Estimates early next week; and I should be very glad to have it in my power to give the Committee the benefit of your views upon a matter which unquestionably involves considerations of national importance.—I am, my Dear Admiral, yours very truly,

“ROBERT PEEL.

“Admiral the Hon. H. Rous.”

“13 Berkeley Square, June 4.

“MY DEAR PEEL,—I have received your letter on the subject of the deterioration of horses in Ireland, which has been represented to you by the patrons of the Irish turf as an acknowledged fact.

“Nothing can be more fallacious than their statement. If these gentlemen sell every first-class stallion, every superior mare, and every promising young horse, it is not surprising that they have nothing left to compete with the third-class of race-horses sent from England to pick up their Royal Plates.

“When these patrons, instead of trying to depreciate their own stock, will go to the expense of buying good stallions for the benefit of their tenants at a reasonable fee, when by private subscriptions they collect tempting prizes to be contended for by Irish horses, they will succeed in the object required.

“No country can compete with the limestone pasturage of Ireland (especially Kildare) for breeding the best horses of every description. At this time Ireland supplies the best heavy-weight hunters to foreigners and English gentlemen. They are bought up at two-years and three-years old by clever agents, always on the look out ready to give large prices. At the last National Steeplechase in England, five out of the first seven horses were Irish. An Irish hunter carries the highest price in every market. Good old horses are therefore scarce in Ireland; French or English money will buy them. True that of late years the Irish turf has not produced brilliant racers like Birdcatcher, Harkaway, The Baron, Faugh-a-Ballagh; the last two, owing to a wise Government, are improving the breed in France. Last year Union Jack and Blarney, the two best two-year-olds, hailed from the sister island. The fact is they convert their best horses into specie, and then complain of the deterioration of stock. In 1863 the British Government gave to the United Kingdom the magnificent donation of L.3465 for Queen's Plates, and in return levied a contribution of L.7126, 7s. by a tax on running horses, the national encouragement being L.3661, 7s. to the bad. The Irish Government gives L.1681 per annum, and, as Ireland is always the favoured country, the race-horse tax is unknown. They take a very different view of this subject in France.

“It is not possible to improve the conditions of the Queen's Plates, as they have been laid down by the Master of the Horse, except by trebling the amount of money, to make it in accordance with the value originally given by the country. If the House of Commons voted L.40,000 for forty Royal Plates, we could increase the weights, and augment the distance of the course; not that such additional onus would contribute to improve the breed, because everything man can do in the shape of expense to produce the best animal is already effected. It is not to be supposed that a sane person will risk a horse worth L.3000 to run four miles under heavy weight for a miserable prize of L.100; such a donation may be a premium for hunting hacks, but not for the original intention of encouraging first-class race-horses. Irish Queen's Plates, for the honour of the old country, must be open to the world. No man would send a horse worth L.600 across the water for such paltry prizes.



“The predilection for heavy weights and long courses, under the impression that by this system you would add to the vigour of the stallion or to the superior fecundity of the mare, is to me a mystery. A race-horse which can run three miles is worth L.3000—a half-mile horse’s value is L.100, which is a sufficient bribe to exercise our ingenuity to produce stout runners. The idea that handicaps are injurious to racing is owing to a want of common sense. How can handicaps deteriorate the breed of horses? Racing is a game of weights, which will equalise the speed of the hare to the tortoise; no person takes an interest in seeing a good horse gallop away from a notorious jade, but a certain difference of weight converts the result into a problem often difficult to solve. All games are handicapped when there is an acknowledged superiority. Chess, billiards, pigeon shooting, pedestrianism—it neither injures the players, the shooting, nor the speed of the man.

“Handicapping may be an inducement to fraud and encouragement to gamble, but it is incorporated into the racing system, it keeps numerous horses in training, giving wages and employment to thousands, amusements to the million, and augments the value of horses to the benefit of the breeders. The destruction of horses is owing to early training, a system based on commercial calculation; “Wanted quick returns to pay an ugly training bill.” What we require is a National Prize of L.5000, to be run for by four-year-olds and upwards, three miles; which might induce horse-owners to show more mercy to the young horses; but no interference or restrictions, which are as injurious to the turf as they are to trade and commerce.—Yours, &c.,

“H. J. Rous.”

## THE IDENTITY OF PLEURO-PNEUMONIA AND MEASLES.

(From the Melbourne Argus, 10th March 1864.)

It is not often that we are called upon to accompany our readers into the esoteric atmosphere of science, but the paper read by Dr William Thomson before the Medical Society of Victoria, on “The Identity of Pleuro-pneumonia and Measles,” contains matter of such vital interest to all who look upon roast beef as a national dish, that we cannot let it pass without an attempt to popularise its contents. The title of the paper itself gives promise of a discovery, and, if Dr Thomson has really found out the solution for the great social problem, it is but fair to him that he should have the benefit of his Eureka. Though various remedies have been suggested from time to time for the disease, it has never been ascertained what pleuro-pneumonia really is. That it is not pleurisy inflammation of the lungs, but a true epizootic distemper, having its seat in those organs, is about as much as could be said of it. Dr Thomson, adopting the true scientific mode of progression, and commencing his operations from the vantage-ground vouchsafed him by experience, that animals have a pathology as well as a physiology common to the human race, was inspired to find an exact analogue for pleuro-pneumonia among the diseases to which the human body is heir. The analogue thus sought for, careful observation and comparison have led him to decide to be nothing other than rubeola. The similarity or identity of the two diseases he considers to be established by the similarity or identity of the symptoms. And though we are concerned rather with the practical utility of this theory than with the *modus operandi* that elaborated it, for the benefit of those who are not likely to be attracted by his paper, we will venture to glance at the train of coincident symptoms that seems to him to establish the true parallel. The whole topic has an interest beyond the pale of the profession, and the analogies detected in the various stages of the disease in the bovine and human subject are curious and striking. In both there is the usual period of sickening, marked by the fever and ague, and soon followed in both, after some days of indefinite illness, by cough, cold, watering eyes, clammy mouth, and dry wiry skin. In the human subject the period of



eruption now sets in, and of thickened respiration. In the animal there is the corresponding bronchial disturbance, and "the bran-like dust in the coat," owing to desquamation of the skin. The disease upon this is on the brink of its third stage. Bronchitis, merging into pneumonia, expectoration, hepatisation, and foetid diarrhoea, recur in rapid succession or simultaneously, and the doom of both victims is pronounced. The next step for the one is the churchyard, for the other the butcher. It would be labour lost to follow Dr Thomson to the dissecting-room, but the *post-mortem* appearances exhibit a likeness that might have been expected from the correspondence of the pathological conditions. One other circumstance the man of science claims strongly as corroborative evidence, and that is, when the last epidemic of rubeola visited this colony, pleuro-pneumonia spread simultaneously. For the rest we must refer the curious reader to another column.

To society generally, the value of Dr Thomson's theory will be its practical utility. As yet he has done no more than arrange his argument. The nature of the disease once ascertained, no doubt the road is opened for the selection of the remedy, and this is the direction in which experiment, if it is to be useful, must be encouraged. We believe that the prospects of sound beef have been gradually acquiring a more cheerful and inviting character for some time. The malady is said by some of the large cattle-owners to be on the decline. But it must be remembered that it is, in its nature as an epidemic, renewable without notice; and if absolute prevention can be attained, the community have a very lively interest in the immediate settlement of the question. In the meantime, legislative action need not be suspended, or the public health be left a prey to the impostor, because scientific curiosity is gratified. On the contrary, there is greater need than ever for some protective measure to the community. Mr Howard's announced intention to initiate a pleuro-pneumonia bill has been received with very general satisfaction by all except cattle-owners, and it will be to the credit of the Ministry if they can be more fortunate in offering a successful resistance to the pressure which those representatives of "vested interests" brought to bear against their predecessors. Some of the stock arguments of opposition which it was the fashion to adduce against the necessity or practicability of any legislation, Mr Thomson has exploded once and for ever, and they must finally be relinquished. Mr O'Shanassy's question to the House on the last discussion of the subject, "Whether it followed that because the lung of an animal was diseased, the meat was also diseased?" can be now satisfactorily answered, that being one of the many problems connected with the complaint and its treatment, which the skill and observation of a private individual has solved, and over which commission after commission, in spite of all their appliances, has floundered and blundered most pitifully, to the great cost of the country.

---

### CONVEYANCE OF CATTLE ACROSS SEAS—PROPOSED CATTLE-SHIPS.

(From the *Scottish Farmer and Horticulturist*, June 1, 1864.)

THE conveyance of fat cattle to distant markets by sea has become to England a very important problem in a twofold sense—*First*, Because she requires the oxen, sheep, and pigs to supply her increasing population with animal food; *Second*, Being a maritime country, and possessed of an immensely increasing shipping trade, it is her interest to have vessels adapted for the purpose of conveying from exporting countries fat stock to supply the demands of her own markets in accordance with the requirements of the age. To allow foreign countries to outstrip her in the march of progress would be an affront to her time-honoured flag.

The proposition is self-evident—the difficulty lies in its reduction to practice. That, however, is no valid reason why the present antiquated sea-going craft,



and barbarous practice with which it is attended, should be continued any longer, but the contrary. But let us go right into the heart of the subject at once practically.

The foreign cattle trade for the London and other markets has now assumed a magnitude that imperatively demands cattle-ships (*i.e.*, steam-boats built on an improved plan), especially for the purpose of conveying fat stock across the Channel from the Continent of Europe. The construction of the present vessels is nothing less than a disgrace to every shipbuilder and shipowner in the United Kingdom. It is now upwards of four thousand years since the patriarch Noah built a large cattle-ship, on nautical principles, that would put all our modern ideas sadly to shame. The details of the antediluvian method of accommodating cattle on board ship are unfortunately wanting, but the general outline of "lower, second, and third storeys" affords our shipbuilders very instructive practical information as to the requirements of cattle. Such being our position, we are left the alternative of thinking for ourselves, *de integro*, as to details.

If we adopt three storeys, and put the steam-boilers, the coals, machinery, food for cattle, &c., in the lower one, it will leave the second and third storeys exclusively for man and beast, both of which would be above the water's edge in fine weather, resembling in principle a large war-ship having three decks, no cattle being upon the upper one. The upper deck would thus be analogous to the quarter-deck, and would extend along midship to foreship, on a level with the gangway. The two departments for cattle could be ventilated in smooth weather, immediately under the deck over each department, by open side-lights. In rough weather a small additional steam-engine, wholly independent of those employed in propelling the vessel, would be required for the artificial ventilation of both departments, by throwing in fresh air and removing the foul when the windows and doors are closed to keep out the heavy seas that break upon the ship. In hot or close weather it might also be frequently necessary to keep the ventilating apparatus in full play.

The height between decks in the two cattle departments ought not to be less than from ten to twelve feet clear.

We now come to the number of berths, including the dimensions of each, with its position in the department. The cattle, for example, could easily walk down a short gangway having an inclination of five or six feet into the lower department, and up a similar incline into the upper one, the animals being walked gently each into its own berth, without experiencing any of that barbarous slinging and rope torture so common under the present system. A trained ox, sheep, and pig might be kept at the embarking sea-port on the Continent, and also at the landing one in England, for calling or leading the strange cattle up and down the gangways. The effect of this upon all gregarious animals is almost incredible.

The movement of the vessel by the waves being greater transversely than longitudinally, it follows that large cattle should stand transversely across the ship. In small vessels there would thus be two rows of beasts—one on each side, with their heads to the sides of the ship and their tails to each other, an open passage being behind them along the whole length of the ship. The stall or berths are thus ranged as they are in the feeding-house or byre of the farmer. In larger ships there might be three rows of cattle-stalls and two longitudinal passages, and in the Noahitic big ships four rows and two passages, the cattle in the two centre rows standing head to head, with tails to the side rows. Each ox-stall or berth should have a door behind, to slide upwards in a groove by two ropes and over pulleys.

Oxen, sheep, and pigs should be kept separate as much as possible, the strong air arising from the one being obnoxious to the other. Such being the case on land, it is difficult to say what the effects might be on health at sea, and what poisonous gases and contagious diseases may be generated. The lower department might be fitted up for oxen, and the upper one for sheep. With twelve feet between decks, there might be two tiers of sheep-pens in each row, the one



above the other. In other respects the sheep department might be fitted up so that it could carry oxen, should circumstances so require. These are details which the demands of trade would soon regulate.

Pens for sheep and pigs would be of uniform size, but it might be otherwise with the stalls for oxen, the size of beasts being often very different. It would, however, be preferable to make the latter also of equal dimensions, and all adapted for the conveyance of the heaviest oxen, and of sufficient width to allow animals being fed and in other respects attended to as at the homestead of the farmer.

The sides of the partitions of ox-stalls should be stuffed with straw, as in the case of railway trucks; and the method of stuffing should be so devised that fresh straw can easily be put in for every voyage, and the stalls and departments regularly washed out with water, purposely to keep them free from disease. The partitions could easily be stuffed in this manner by means of flat ropes or girthing, the straw being placed between the latter and the former. The decks should have a coating of some composition of sufficient thickness and imperviousness to protect the wood below, and of a character to prevent disease; and were it covered with peat charcoal, or even ground peat, a few inches in depth, with a little cut straw over, its value for manure would always fetch something more than its prime cost; so that the cattle-ship company would gain a profit by paying proper attention to the littering and comfort of the stock on board (and this, we may here apostrophise, is the true method of doing things in a business manner.)

In a wholesale trade, like that for which cattle-ships would have to provide in rough weather, oxen should be compelled to lie at ease by casting them, and tying their fore feet to their hind feet, in the way veterinarians do when they intend to perform any operation upon them. For this purpose the animals should have broad straps buckled upon their legs, so that they could be tied and loosened in a moment's time, without any harm being sustained. Calves and sheep are thus tied by farmers, and conveyed in carts. Shepherds also tie their sheep when shearing them. Some calves and oxen, when thus tied, knock about for a little, but the moment they find themselves completely fast, and less the matter when lying still than when struggling, they soon choose the former alternative; and the same result would be experienced when at sea. Ill-tempered and restless animals should be tied even when the sea is smooth, in order to prevent disturbance to the rest of the stock.

In each department there should be an infirmary for sick animals, apart from the sound ones; and every ship should carry an experienced veterinarian to attend to the health of cattle, and to prevent diseased animals being taken on board. If there should not be a sick animal in the infirmary for one out of ten voyages, there is no reason why a sick animal should be allowed to remain amongst the others, to spread contagion it may be throughout the whole herd once in a hundred times.

The size of the ship and the number of cattle is a simple matter of pounds, shillings, and pence, about which next to nothing requires to be said. It would not take a very large sea-going craft to carry in each department a hundred head of the heaviest bullocks sent to the London market, or a cargo of three hundred, there being three rows of fifty in the lower deck, and a like number in the second storey; four hundred at four rows of fifty each; and six hundred at four rows of seventy-five each.

Would the project pay a Cattle-Ship Company (Limited)? This is the finale; and however self-evident the problem may be in favour of the enterprise, it is nevertheless one of that peculiar character which is more than ordinarily liable to be bungled by seafaring people, simply because they have little or no accurate knowledge of how cattle are managed by farmers; while herdsmen and drovers are equally far from home when at sea. That there is now a sufficiently paying trade, were it properly organised and conducted on the contemplated method of conveyance, no one can doubt who knows anything

practically about the enormous loss now sustained. It may be difficult to convince foreign farmers of the magnitude of this loss, or to procure for them at the outset the full advantages to which they would be entitled; for it would of necessity take some time, for example, before London butchers and salesmen could ascertain the increase of weight and the improvement in the quality of the beef that would be realised. Like all other improved practices, the one in question would have to work its way onwards and upwards against a strong current of self-interest and trade prejudice; but against all opposition of this kind it would eventually triumph, and return the foreign farmer an increase of profit, after paying the Cattle-Ship Company remunerating interest on their capital.

The conclusion at which we have thus arrived is equally applicable to Ireland and those parts of the north of Scotland that ship their cattle to the southern markets. To the Irish farmer the project is a doubly interesting one, for proper cattle-ships are much needed to convey the fine cattle of the sister-country across the Channel.

---

### GRASS STAGGERS IN CATTLE—IMPACTION OF THE MANYFOLDS.

(From the *Scottish Farmer and Horticulturist*, June 1, 1864.)

THIS name is given to a disorder in which symptoms of delirium occur sympathetically with derangement of the digestive organs, and especially of the third stomach or manyfolds. This latter organ is placed on the anterior and right side of the paunch close behind the liver, and covered by the short ribs on the right side. When fully distended, it is somewhat kidney-shaped, with its straight or notched border attached to the paunch and its convex border turned upward and forward. Almost every one is familiar with its internal arrangement. Along its attached border is a passage conducting from the lower end of the gullet from the first and from the second stomachs into the fourth or true digestive stomach, and into this passage the longest of the mucous folds projects. The folds, which are simply reflections of the lining mucous membrane, are attached to the convex border of the organ, and to each side of this as far as the attached border. The folds are arranged in regular gradations as regards length. A certain number, usually from twelve to fifteen, are so long as nearly to gain the straight border; next, between every two of these is a fold of nearly half the length; again on each side of the latter is another fold the length of which is again diminished by a half; and lastly, at the bases of these are slight ridges, which scarcely deserve the name of folds. The surface of the folds are covered by a dense cuticular coat, thickly studded with papillary eminences, some of which are pointed and others flattened on the summit; but both are extremely hard and resistant.

This stomach seems to be chiefly useful as a temporary receptacle for food which has already been reduced to a certain state of comminution. The hardness and thickness of its lining membrane, together with the numerous projections upon its surface, ensure the further trituration of the food between the leaves during the muscular contractions of the stomach. From the compression between the folds, the food is further deprived of its liquid constituents; and accordingly, that which is contained in this organ, even in a state of perfect health, is in a comparatively dry condition.

In grass staggers, the functions of this organ are destroyed through the introduction of an excess of highly stimulating or irritant food, or of certain other noxious agents. Acute poisoning by lead produces symptoms exactly analogous by its paralysing effects on the stomach. Another form of the affection more slowly developed, is induced by the gradual desiccation and hardening of tough and fibrous aliments between the leaves of the manyfolds. This is known as *fardel bound*.



Pure grass staggers, or the acute form of this malady, often occurs in cattle when newly put upon strong young grass in spring or early summer. It is also frequently met with towards autumn when the spring grass has become hard and fibrous, and intimately mixed with a fresher and more recent growth. It may be further favoured by a dryness of the soil and insufficient supply of water. It is curious, too, that a change from soft to hard water will often conduce to this affection; so that we find it prevailing at certain seasons after the supply of pond or river water has been exhausted, or when the cattle are changed to a new pasture where the water is of a harder description. In all cases, however, it depends on indigestion, with vascular excitement, over distension, or paralysis of the third stomach.

The symptoms of the affection vary much at the outset. Sometimes there are some dulness and costiveness for fifteen or twenty-four hours before any other symptoms are noticed. In other cases, there may have been some disorder of the digestive organs for several days, indicated by slight loss of appetite and increased consistency of the droppings, which are coated with a film of mucus. Sometimes, on the other hand, the malady is ushered in by a slight diarrhoea. Very frequently nothing is noticed amiss until within a few hours of the onset of the brain symptoms, and even until the appearance of the latter the subject may continue to feed. For some hours previously, however, there might have been noticed some dulness, semi-closed and blood-shot eyes, and a tendency to separate from the rest of the herd. The animal soon becomes excited and wild-looking, or the dulness increases, and soon it gets quite delirious, turning round to one side, or running straight forward until it stumbles over some obstacle, when it lies struggling and bellowing until the violence of the paroxysm has passed off. If in a building, it pushes its head violently against the wall, breaking the teeth or horns, and roaring terribly. Violent muscular tremblings are frequently shown during the paroxysms, and sometimes they are ushered in by this symptom. During the paroxysms, there are champing of the jaws and a flow of frothy saliva from the mouth.

This affection often terminates fatally in a few hours after the onset of the head symptoms, though in less severe cases the subject may survive a day or two, and even ultimately recover.

In fatal cases, the first three compartments of the stomach are commonly filled with food recently taken. The first stomach, and more especially the fourth, often contains a quantity of earth, sand, or gravel, showing that the appetite had been for some time depraved before being entirely lost. The lining mucous membrane of the stomachs presents patches, more or less extensive, of vascular congestion; and its cuticular layer is detached with great readiness. The brain and its coverings are also congested, and clots of effused blood are sometimes met with in its ventricles.

When the disease is once established, medical treatment is commonly unavailing. In a few hours, and before any medicine can have time to act, the violence of the affection will have destroyed the animal. Even in less violent cases, the paralysis of the stomachs and intestines renders the patient very little amenable to the action of medicine. In all cases, however, purgative medicine is urgently called for, and this, even though the bowels seem to be already in a sufficiently relaxed condition. From a pound and a-half to two pounds of Epsom salts may be given in water sweetened by a pound of treacle, and as much liquid allowed as the patient can be made to drink. If it refuse to drink, large quantities of water and treacle may be horned over frequently, as this greatly facilitates the unloading of the stomach. Injections of warm water should also be thrown up every half-hour.

Should delirium supervene, the animal may be bled from the jugular to an extent varying according to its size and condition and the urgency of the symptoms. The best plan is to stop as soon as the pulse becomes softer, or the brain symptoms less marked. Cold water, or, if it can be had, ice, should be kept constantly applied to the head; and the patient should be fastened to a strong stake to prevent it from injuring itself.



If the patient survive twenty-four hours, and if there be still no appearance of the purgative acting, it may be repeated. In cases of recovery, it may be found needful to give repeated doses of laxative medicine at intervals of several days, in order to keep the bowels in an active state. Also, for some time after the bowels have responded to the medicine, gruels and thin mashies only should be allowed, and the patient should be restored to its customary diet by slow degrees.

Preventive treatment is much more satisfactory than medicinal. Cattle should not be turned out to grass while hungry, nor should they be turned into a pasture wet with dew or rain. If well fed before being turned out, if allowed green food in small quantities only for the first week, and if permitted an ample supply of fresh, soft water, they will be much less likely to suffer from the transition from winter fare to the spring grass.

Where a case of grass staggers has occurred in a herd, the whole should be kept without food for eight hours, and a smart purgative should then be given to each. A careful investigation should be made to ascertain if they have had access to lead in any form; and in any case it is well to change the pasturage, and the water, if that is found to be impregnated with earthy salts. A supply of rock salt, to be licked at will, is often very useful in giving a proper tone to the digestive organs.

### ALLEGED DETERIORATION OF THE BREED OF HORSES IN IRELAND.

THE following Address has been presented to Her Majesty by the Royal Agricultural Society of Ireland, on the alleged deterioration of the breed of Horses in that part of the United Kingdom :—

“ The Humble Address of the President, Vice-Presidents, and Council of the Royal Agricultural Society of Ireland to Her Most Gracious Majesty the Queen.

“ The President, Vice-Presidents, and Council of the Royal Agricultural Society of Ireland, associated with the committee appointed to inquire into the cause of the deterioration of horses generally throughout Ireland, desire, most humbly, to approach and address your most gracious Majesty upon a subject which appears to them of the most vital importance, not to this country alone, but to the British empire at large, and to the throne, which it is their earnest prayer your most gracious Majesty may long live to occupy.

“ For some time the Council of the Royal Agricultural Society, whose pleasure and duty it is to devote their attention to the interests and welfare of this portion of your Majesty's dominions, have observed with much concern at their annual exhibitions the increasing inferiority of that class of horses for which Ireland was once so celebrated, and which heretofore provided such a supply (of horses) for the cavalry and artillery branches of your Majesty's service, as for power, endurance, and general excellence were considered superior to any other horses in Europe. Latterly, however, the reduction in the number and deterioration in the quality of this class of horses has been brought distinctly before the Royal Agricultural Society, as a matter of serious and peculiar consequence, affecting not so much our material wealth as those military resources considered so necessary for our prestige as a great power, and so important to this nation.

“ Under such circumstances a committee was organised, consisting of noblemen and gentlemen possessing information on the existing state of horses in the various counties of Ireland, with several senior military officers, representing the cavalry and royal artillery. The committee thus composed have also had the assistance of persons whose professional duties and avocations in life afforded them special opportunity of becoming practically and intimately acquainted with the subject of inquiry, their experience in many instances ex-



tending to all parts of the United Kingdom, and to the character of Irish horses for periods varying from twenty to fifty years.

“ The result of this inquiry has been set forth in a report to the Council of the Royal Agricultural Society, which has been submitted for the consideration of your Majesty, your Majesty’s Prime Minister, his Royal Highness the Commander-in-Chief, and the Secretary of State for War, as it contained an accumulation of such positive evidences as forced on the attention of memorialists a state of things far more serious than was at first contemplated, viz., such a marked deterioration in the quality of the horses now being bred in Ireland, and such a corresponding reduction in the number of that class of horses available for the service of the cavalry and artillery, as, in the event of any contingency requiring even a slight increase of horses for those branches of the service so essential to the British army, the consequence might be severely felt at a time when it could not by any possibility be remedied. Your memorialists, therefore, felt they would be deficient in their duty to their most gracious Sovereign and to their country, if they failed to direct the attention of your Majesty to what appears to them of such deep national importance, and involving a state of things which they are led to believe, from an important letter published, addressed to the Speaker of the House of Commons (and alluded to in report), as not merely confined to Ireland.

“ Much, however, as it is the duty of the Royal Agricultural Society of Ireland to consider the pecuniary part of the question involved in the great deterioration in the horses of Ireland, and the loss of material wealth, from the causes pointed out in the report of memorialists as consequent on the great changes which have taken place in this country ; yet memorialists are satisfied to leave that part of the question to the usual sources of supply and demand. At same time, they respectfully submit that the general character of the horses of a country must ever determine the quality of horses on which our cavalry are mounted and artillery provided for. Yet, while continuous rapidity of movement for cavalry and artillery, consequent on the increased range and precision of the rifle principle, demands a combination of more power and speed in the horses, the evidence which has come so strongly before memorialists shows that there is not only no corresponding increase in the number of that class of horses capable of sustained endurance at the requisite pace from which these most essential arms of the service can alone be efficiently provided, but absolutely the reverse.

“ Your memorialists, therefore, humbly pray that a Royal Commission may issue to consider a state of things which they deem of serious national importance, and to determine a remedy ; and your memorialists will ever pray, &c.”

The following reply has been addressed to the Earl of Bessborough, as President of the Society :—

“ Downing Street, 17th May 1864.

“ MY LORD,—Lord Palmerston is sorry to learn, from the memorial addressed by the Royal Agricultural Society of Ireland to the Queen, that good and serviceable horses are becoming more scarce in Ireland than they were some years ago, and that the cavalry and artillery find great difficulty in procuring suitable horses for those services. Lord Palmerston, however, does not see how a Royal Commission could suggest any effectual remedy for this state of things. The supply of horses in any country must vary according to the views which breeders of horses take of the comparative advantage and profit to be derived from breeding horses, or from breeding cattle, sheep, or pigs, or from the raising of crops instead of breeding animals ; and no interference of the Government in the private arrangements of individuals can be attended with any useful or advantageous result. If there is at present a short supply of horses in Ireland, and the demand for horses remains the same, it is probable that the law which regulates the proportions of demand and supply will tend to increase the number of horses bred ; but if Lord Palmerston rightly understands the memorial, the demand

for horses in Ireland is on the increase, inasmuch as a considerable number of foreign buyers traverse the country, offering and giving better prices than are given for our own military service, and he infers that the scarcity of horses complained of by the Irish Royal Agricultural Society, arises not so much from fewer good horses being bred, as from the circumstance that more good horses are exported to foreign countries, and a smaller number, therefore, are left for the home demand. Be this, however, as it may, there does not appear to Lord Palmerston to be any good ground for the appointment of a Royal Commission to inquire into the matter.—I have the honour to be, my Lord, your Lordship's obedient servant,

“ C. G. BARRINGTON.

“ The President of the Royal Agricultural  
“ Society of Ireland.”

## BARREN MARES.

(*From the Sporting Gazette, May 14, 1864.*)

TO THE EDITOR OF “ THE SPORTING GAZETTE.”

MR EDITOR,—At Mamhead, on the 7th inst., foaled Clapnet, a filly to Ellington, and she will be put to Gemma di Vergy. This mare was bought by me at Tattersall's, in April last, from Mr Head, for the purpose of trying an experiment, which I once before publicly recommended to the notice of breeders—viz., the dilatation of the mouth of the womb. Clapnet, now seven years old, was covered in 1860 by Lord of the Isles; in 1861 by Gemma di Vergy; and by Surplice in 1862, and proved barren to each. Mr Moon, the veterinary surgeon, of Kingston, a few days after her purchase, passed his fingers through the neck of the uterus, and the mare was afterwards covered by Ellington, for the first time, on April 3d. She was covered many times subsequently, and the date of her foaling, if she went the usual period, would prove that she was not stinted early; but as some mares go only ten months, whilst others go over the year, the time of gestation cannot be always relied upon.

At the time I commented upon this subject last year, I was not aware that the operation was one well known and practised in many of our studs. I believe it was Admiral Rous who told me that in Arabia, or some other Eastern countries, the practice is a common one, and the testimony of Mr Blenkiron, whose letter I send you, is strongly in its favour.—Yours, &c.

W. J. GOODWIN.

Hampton Court, May 10, 1864.

[Clapnet, by Irish Birdcatcher (by Sir Hercules) dam Lady Lift, by Sir Hercules, in foal to Gemma di Vergy by Sir Hercules, must have a produce sufficiently bred “ in and in ” to satisfy the most infatuated patron of such a system.—ED.]

### *Copy of Mr Blenkiron's Letter.*

“ Middle Park, Eltham, Kent, Dec. 14, 1863.

“ MY DEAR SIR,—Respecting the operation on mares, alluded to by you in your letter, I can assure you it has been performed here very frequently with great success. There is a very striking instance of its efficiency occurred here this last season. Polly, by Touchstone, had been covered year after year without producing anything. Before letting her go to the horse I got my man to pass his hand. The mare never broke, and is most certainly in foal. I have most of my maiden mares so operated on.—Yours faithfully,

“ W. M. BLINKIRON.”



## ON BREAKING DOWN.

*(From the Sporting Gazette, June 11, 1864.)*

TO THE EDITOR OF "THE SPORTING GAZETTE."

SIR,—A letter from Mr Gamgee in your last impression strikes me as opening up a subject of great interest to all owners of horses. It is for this reason that I venture to ask you to insert this record of my personal experience of the subjects he mentions. I must, however, say that I feel myself quite incompetent to give any opinion on the scientific and theoretical parts of his letter; but my experience may be of use in leading to discussion.

In the autumn of last year I ran a mare in a steeple-chase. On the first day of the meeting she was slightly bruised on one of her fetlock joints. She was engaged in a steeple-chase on the second day, and up to the moment of saddling almost, neither my trainer nor myself could make up our minds whether the injury was sufficient to stop her running. We took the professional opinion of a veterinary surgeon of eminence in the West of England, and he decided that the mare should start. After running more than two-thirds of the course with a strong lead, and having jumped all the fences safely, she appeared to slip in going down a ploughed field, and she broke her leg short off between the knee and the fetlock, and was destroyed on the spot, of course.

Can Mr Gamgee, according to his theory, connect this accident with the previous accident? It was the same leg. As to the latter part of Mr Gamgee's letter, I can state this:—In the year 1850 or 1851, I will not be positive which, I bought a nearly thoroughbred mare, in Worcestershire. Her hocks were generally allowed to be as good as could be; and when I state that she won me many hundreds of pounds (stakes) in trotting matches, I think I am justified in stating that the general opinion was fully borne out. I bred two colts from her, from two different sires, both of which sires were considered to be good, both in hocks, thighs, and quarters. Both colts went wrong in their hocks, as I believed then, and believe now, *entirely owing to the nature of the ground on which they were kept as yearlings—viz., small, short fields, and rather hilly*. I was so annoyed with the result that I gave the dam away (to go to Ireland) to a near relative of mine; and she after that bred a really good colt, without any signs of infirmity about the hocks.—Yours faithfully,

C. DEVON.

## DEATH OF GEORGE ERNEST LLEWELLYN.

*(From the Daily Telegraph of June 25, 1864.)*

No line of life ought to produce better men than the practice of medicine. That which can only be an occasional luxury of others, the relief of pain, is their daily trade. That which is the study of few but the rich and leisurely—the wonderful operations of nature—is their constant business to notice and comprehend. They follow no dubious principles like the lawyer; they feel no scruples of intellect and conscience like the clergyman; they need not to be ordered to march and countermarch, to sail or stay ashore, like the soldier and sailor; they may lead a life, if they please, at once useful, elevating, independent, and profitable. But the "good physician" is, practically, very hard to find. There are plenty of flourishing practitioners—practitioners glib at long Latin compounds and prescriptions, and speciality men, who make their fortune and amuse wealthy patients with speculum or stethoscope. But the man we have in our mind, and ought to meet with every day instead of merely now and then, is he who comprehends the noble nature of his profession. With "heart of lion and hand of silk"—tender to feel for pain, but with nerves of steel and brain as clear and sound as a bell when he deals with it—the man we

mean approaches the sick-bed in palace or cottage. He knows—he is too wise not to know—what a pitiful state our boasted medical science is in; inflated lectures have never deceived him, nor has he been misled by windy pretensions into the error of presumptuous certainty in cases where the best knowledge is at present merely experiment. He does not treat the body like a slope-basin for drugs, nor drain away its principle of life with lancets or leeches, nor blister and persecute, nor “meddle and muddle” with the image of God. Reverently but courageously he waits upon Nature, tries to learn her mind, and obey it; makes himself her pupil always—her master, never; learns while he teaches, and observes while he decides. For such, how splendid are the rewards which his profession promises. Even worldly prosperity will surely follow the cures which rational treatment effects; but this, to the kind of man we have in view, will be a secondary consideration. He will often, by laughing at learned quackery, and helping instead of affronting nature, rescue valuable lives from a premature end; he will assuage intolerable pain, restore mothers and fathers to their families, give back to the hearth the limbs of little ones that seemed doomed to die; and day by day, while he relieves individual pain and weakness, glean from it contributions to the general stock of science. For all this, innumerable thanks, inexpressible gratitude, will attend him. His name may not be famous, but it will be beloved; he may not drive about in a dashing carriage, but he will sit as soft as the biggest of medical bigwigs in a cab, as he rides to or from his task of doing God’s holy work in the world, and healing, relieving, comforting, assisting His creatures.

We seem to have a glimpse of such a character in the young surgeon of the *Alabama*, who was the only one of her officers to go down with that famous and ill-fated cruiser. The hero of the fight off Cherbourg seems to us, indeed, to have been Ernest George Llewellyn, though we can only judge him by the last incident of his life. We are told that he had been a distinguished student of medicine, and gained rewards and medals during his noviciate; and, for the most part, the “true physician” is sure to prove a skilful and learned one. Indeed, it is the view of his profession that presents itself to a real and ardent student which ought, we maintain, to make a good doctor essentially and before everything a humane, self-sacrificing, and devoted one. Mr Llewellyn appears to have been such, at least if his career—as we do not doubt—was of a colour with its close. He was surgeon to the *Alabama*, and of course responsible for her wounded. Observe, then, how he fulfilled his charge upon a sinking deck. The *Alabama* was down in the water, till the muzzles of her guns were washing in the sea; she was obviously foundering, and the order was given to get the hurt men into boats. Only two of these were uninjured, and the meaning was that the hale must swim for their lives, while the bleeding sailors were put in safety. There was naturally great confusion and a rush of “egotists” to the side—one of whom, quite unhurt, would have pressed into the boat. But the young doctor had to see all his patients stowed away first, and he stopped the sneaking lubber. “See,” he said, “I want to save my life as much as you, but the wounded must be taken care of first.” They sung out to him to come over the side. “We have room enough for you, doctor,” the wounded part of the crew called out: but his answer was: “I won’t help to peril you, my men. Shove off.” He couldn’t tend their hurts upon that foundering ship’s deck, but he could perform his duty still by helping to save their lives. With the sound men he had nothing to do; but the sick were in his charge, and that is how he stuck to it. We protest we would give, were we his captain, half the prizes of the *Alabama* to recover his young life; for the ship went shortly down, and he upon it. Nor was anything afterwards seen of the *Alabama*’s surgeon. If anybody is desirous of getting rid of guineas, it seems to us that a monument to this young Englishman might very well absorb them. His vocation was not to burn merchantmen, but to save men, and to the last minute of his life he was thus faithful to it.

There is a moral to the proud story, too, which concerns ourselves, our



services, and the War Office and Admiralty. This is the breed of men we want to redeem our hospitals between decks and in the field from some of the horrors of war. At this moment war is in the air—rumours and fears prevail—nobody knows upon what campaign by sea and land we may not soon be launched. And what have our authorities done to get good and true men of the Llewellyn stamp to follow our march, and sail upon the sea with our fleet? They have done, we reply, everything they possibly can to deter them from joining, and to make the medical department in the army odious and unpopular. There has been a stupid jealousy set on foot between “combatant” and “non-combatant” officers—as if the slayer were superior to the healer—which is having the effect of utterly demoralising the medical division of our services. Skilful and humane doctors have been so persistently affronted by the regulations, and students so discouraged by the action about the warrant of 1858, that every lad of promise turns his face from the service, and men grown grey in honourable exertions take their scanty pension and quit their uniform with disgust. “Non-combatant officers,” forsooth! as if heroism enough has not been shown in the Crimea, in India—in “charging” cholera, and “forming square to receive” typhus and typhoid—to spare science this ignorant and suicidal insult. But, in the future, our soldiers will have to fight with no such certainty that, wherever they fall, a brave heart and a cool hand will bandage their hurt under fire, and snatch them from death. We are carefully taking measures to keep men like Llewellyn out of our own ranks, and to drive them to Confederate cruisers, foreign service—anything and everything sooner than the regiments and ships where they are officially snubbed. At this moment an Indian journal remarks that “medical appointments are being filled by roughs from Edinburgh and Dublin.” It is a plain way of putting it, but it is not far from the truth; for appointments once honourably striven for are now going a-begging; and, for the army’s sake in these times of peril, we take a moral from the brave young doctor’s death, to point out the ignorant and indifferent set with which the Horse Guards are doing their best, or worst, to recruit our departments.

## FRACTURE OF THE SESAMOID BONES OF THE OFF FORE LEG OF A HORSE WITH LUXATION OF THE FETLOCK JOINT.

By Professor VARNELL.

(From the *Veterinarian*, June 1864).

IN the month of April 1864, I had sent to me a specimen of fracture of the *sesamoid* bones of the off fore-leg of an aged thorough-bred horse, complicated with luxation of the fetlock joint. Two cases only of this description have before come under my notice, and I am inclined to think, without making especial reference to our various veterinary authors, that very few instances of the kind have been recorded. For this reason I am the more indebted to Mr Blakeway for the trouble he has taken in sending the specimen, and also for the history of the case as contained in the following letter.

“STOURBRIDGE, April 21st, 1864.

“DEAR SIR,—I met with, to me, rather a rare case this week, which I will relate, and then you will judge for yourself. On Tuesday last I was sent for to our race-course, about one mile from town, to see an aged thorough-bred gelding that had ‘broken down’ while taking a gallop, he having to run at Kidderminster steeple-chase on the following Tuesday. I found he had dislocated the off fore-fetlock joint. The condyloid extremity of the large metacarpal bone appeared to be resting on the sesamoid bones. I advised that he should be destroyed, which was done immediately. Upon examining the leg

at my leisure, I found the suspensory ligament completely ruptured. A small portion also of the superior part of both sesamoid bones was broken off. The ligaments of the joint were completely torn asunder, and the large metacarpal bone was resting against the flexor tendons and on the broken surface of the sesamoid bones. There was a good deal of extravasated blood around the joint.

"I may add that the horse was galloping on a perfectly level course, and nothing could be seen as being likely to have caused the accident. He had been previously fired on both fore-legs, and during the last season he had gone a little stale on them.

"I send the bones, &c. for your examination. I am, &c., F. BLAKEWAY.

"To G. W. VARNELL, Esq."

I found the bones to be fractured in a transverse direction, a little above their middle, and, in addition, I noticed that the upper part of the inner one was broken into three or four pieces. The capsular ligament was much torn, and the outer branch of the superior sesamoidal ligament was also lacerated. The inner branch, however, had not suffered from recent injury, but was much thickened from previous disease evidently of long standing. In attempting to elucidate the most prominent features of this case, it will be necessary to discuss two or three points. In the first place, it may be asked, what was the immediate cause of the fracture? Did it take place from over-tension, or from a blow produced by the hind-foot during the act of progression? Upon reflection, I think the former was the most probable cause. The flexor tendons and common integument would prevent, to some extent, sufficient force being applied to the bones in question to cause fracture. If, then, it occurred, as I think it did, from over-tension, it may again be asked, if there were any predisposing causes favourable to such a lesion? I am inclined to think there were, as the fractured bones did not appear to be so compact as these bones are usually found—their structure seemed more spongy and fragile—at least such was my impression. This being the case, I think we may fairly admit that they were incapable of resisting the same amount of force which they would have done had their structure been of normal density and toughness. Bones are tough, by virtue of the animal matter they contain; and hard, through the earthy material in their composition. Let there be a deficiency of either of these normal constituents, and they become liable to be injured, through the common physical forces they are exposed to. I may next observe, that the superior sesamoidal ligament was diseased to a great extent. The outer branch was partially torn through, while the inner was much thickened from disease of long standing. This ligament, in its normal condition, yields more than ordinary ligamentous tissue when weight is thrown upon it, and it contains in its structure a variable amount of contractile tissue, which is not the case with articular ligaments. The two functions possessed by this ligament, although very slight, yet, if destroyed even to a small extent by disease, would predispose to such lesions as were observed in the bones above alluded to. And such may have been the predisposing or remote causes.

We have next to take into consideration the immediate cause, or even causes—for I can suppose there may have been more than one in operation. At any rate, one cause is obvious enough, and cannot be questioned, viz., the exertion the horse was put to. Added to this, and which is decidedly more direct, is the probability of his having made what is sometimes termed "a false step," or an unconscious movement, whereby the whole weight would be suddenly thrown upon the bones and ligaments, which, if impaired by disease, would, under such circumstances, be very likely to give way. Such seems to me to be an explanation, imperfect though it is, of the cause of the fracture of the sesamoid bones in this particular instance.



## A HINT FOR THE CHANCELLOR OF THE EXCHEQUER.— DISEASED MEAT—DISEASED MILK.

*(From the Gardener's Chronicle and Agricultural Gazette, June 25, 1864).*

CAN nothing be done to relieve town dwellers from the abominations (worse than the sewage which they will keep all to themselves and the fishes) of almost carrion flesh, and cruelly unwholesome milk, the baby's beverage? Professor Gamgee may cure sick animals, but his art can't reach "death in the pot," of which there is now increasing danger for adults and infants. These growing evils may be truly ascribed to various causes, but we have now only to deal with their pernicious effects, so we must not allow red-tape routine or circumlocution to interpose with the suppression of patent scandals and gross evils merely because they are of long standing. I can respect "vested rights" and freedom in trade, but only when they are honest. The real question is, can nothing be done summarily and openly to mitigate the growing evils? Surely some means may be devised for extending the Ægis of the British Constitution to the British million in items so vitally important as those of their daily meat and drink. I know 'tis unpleasant to recommend taxation; but still, if something in this way is necessary, as a means for preserving the public health, the wellbeing of many must be considered before the privileges of the few. Bad meat, bad milk, bad bread, must, at all risks, be kept out of the public markets, and if the Legislature see fit to go about this in earnest, if they cannot entirely succeed, they certainly may, to a large extent, by bringing all dealers in articles of food liable to adulteration under the ban of the law—butchers, bakers, milk-sellers, &c., should all be required to take out an annual license; this has worked admirably with a much poorer class—the cab-drivers—men who live absolutely by manual labour. I would apply the chicory test to milk, by requiring those who only watered that fluid—and who that sells it does not?—to affix in large letters the following notice—"This is sold as a mixture of water and milk;" and through the machinery of the police, or peripatetic inspectors, watch and ward may be kept over the "milk walks," power being taken to treat bad milk in England, as it is most properly treated in France—turned on the streets—to 'waste its sweetness (?) on the desert air;' dealers would soon find it more to their advantage to sell pure milk at a fair price rather than risk total loss by diluting it, and thus retailing poison openly "at full price." Vendors of meat can surely afford a small tax as well as grocers, publicans, brewers, &c., by this means every man legally authorised to offer animal food for sale would be known to the Government, and for trivial offences their licenses should be marked, for gross ones, they should be forfeited. The Chancellor of the Exchequer may thus obtain some accession of revenue, which may prove crumbs of comfort for farmers, when next the right hon. gentleman ventures to think seriously about easing the malt-tax. Very great and salutary protection may thus be easily and cheaply obtained for the public stomach, and if the public health really demands stringent measures for its preservation, honest men cannot complain, for my suggestion can only reach rogues.

---

## HYDROPHOBIA.

*(From the Lancet, June 25, 1864.)*

THE Correspondent of the "Lancet" says,—“Cases of hydrophobia still continue to occur in this town. In my last communication, I informed you of the man who was bitten in the arm. The same dog bit its mistress still more severely in the cheek and ear. In her case, the injured parts were immediately removed; and as yet no bad symptoms have manifested themselves, though seven months have now elapsed since the occurrence. The *post-mortem* examination of the poor man had not been made at the time I sent up my previous

letter. The brain and spinal marrow, with the nerves proceeding from the upper part of the latter, the throat, and all the large viscera, were examined; but no decidedly abnormal appearances were found. Since then, two boys have died from the same fell disease. One, eleven years of age, was bitten in the lip very severely on the 10th of April. He was taken to the Royal Infirmary, two to three hours at least elapsing before his arrival there. Nitrate of silver was applied to the wound. He remained in the Infirmary. On the 8th of May, the first symptoms of hydrophobia manifested themselves; and on the 10th, he died. In the other and more recent case—a boy of twelve years—the terrible signs of hydrophobia showed themselves on the 1st of June. It was then recollected that he had been bitten three or four weeks before in the thumb by strange dog, and for which nothing had been done. He died on the 3d of June. I do not detail the symptoms in either case, because they closely resembled previous ones. They are all characterised by a peculiar susceptibility about the pharynx and upper part of the windpipe, which, as it increases, gives rise to constant efforts to clear the throat, and, in doing so, to the peculiar noises that are sometimes heard. Neither do I tell of the treatment. Several medical practitioners saw each of the young patients, and various means were tried. Narcotics seem to be the most often resorted to, of course with the hope of alleviating the great suffering; but the result certainly does not afford any evidence in their favour. The attention of the authorities of the town has been thoroughly roused by the great number of deaths that have now occurred from this cause; and for the last few weeks the crusade against dogs has been terrific. Every day, from thirty to forty people attend the Police Court in answer to summonses they have received, and are in most cases fined from 1s. to 5s., and costs, for allowing their dogs to be at large. During the month of May alone, 700 dogs were destroyed, and 1219 informations laid against owners. Of course these proceedings have given rise to a great deal of dissatisfaction, and numerous letters have appeared in the local journals on the subject. Still, to insist on all dogs being muzzled or led by a string when out in the streets seems the only effectual remedy for checking the progress of rabies, which has been now for some years on the increase. In most of the cases of hydrophobia, it has come out in evidence, that the dog that had bitten the person, did also bite several other dogs; therefore, if it were practicable to confine all dogs till such as had been bitten had manifested the disease and been destroyed, there might be some hope of making hydrophobia of as rare occurrence as formerly.”

---

## A NEW FORAGE PLANT.

(From the *Scottish Farmer and Agriculturist*, June 8, 1864.)

THE following is an abstract of a paper lately read by M. Alphonse Lavallo before the Imperial and Central Agricultural Society of France:—

The Brome de Schrader is a grass almost unknown in Europe. It is a native of the Northern States of America; and in Carolina, where it grows vigorously, it is commonly confounded by cultivators with other species of the same kind known under the name of Fescue Grass. The Brome de Schrader (*Bromus Schraderi*, Kunth) is a plant of vigorous growth, and is capable of yielding from four to five green crops per annum of excellent forage, especially for milking cows. The first cut may be taken towards the end of March, provided the crop of the preceding year has been taken early; in any case, and at the latest, the 20th April, or generally just before the rye crop, when cultivated for green food, the cut can be taken. The Brome, when dried, makes excellent hay, and its yield in seed is considerable; the straw also preserves a fair proportion of the quality of the hay, so that in certain cases it may be used as food in the straw-yard. This kind of forage is particularly favourable for the



production of milk, and the cows thrive under it exceedingly well. The Brome requires little cultivation, but takes so strong a hold on the soil that it is always in good condition; it also accommodates itself to almost all kinds of soil, except the very driest, and can subsist for several years—perhaps six or eight; indeed, after being five years on the same soil I have not perceived that the crop has diminished. One peculiarity of the Brome de Schrader is, that it presents at each cut, and upon each stalk, several ears, in which the seed, if not ripe, is at least in a consistent form, which is a rare case with forage perfectly green. This, I believe, is one of the principal causes of the nutritious value of this plant, which has enabled me to cut off the ears which are intended for seed with a sickle, and to mow afterwards the grass, without seeing any difference between that and other crops. If the grain is very light, the yield on the first cut is greater by several hectolitres than that of the finest oat crops.

#### YIELD OF THE GREEN CROP.

It is principally as a green crop that the Brome de Schrader can be of the greatest utility. Thus, when sown upon what may be termed naked land, which had received no manure, the yield at the first cut was 17,300 kilos. per hectare. The yield of three other cuts was 18,970 kilos.—that is to say, each hectare yielded a total weight of 36,270 kilos. But it ought to be remarked, that this was the result of fifteen months' cultivation, for the Brome de Schrader shoots both in autumn and winter. This yield may appear exaggerated; but it is not even a maximum, for the land on which the growth took place, though good, was new; and, besides not receiving any manure, the preceding season had been very dry. The plant, in short, occupied the same soil for three years. Upon other hand, also, the first cut of a crop has yielded 19,100 kilos., and I only regret that I have no account of the subsequent cuts.

#### YIELD OF HAY.

The Brome de Schrader, converted into hay, loses weight considerably—nearly two-thirds. Thus the 17,300 kilos. of the green crop yielded me 6000 kilos. of hay. On weighing it a second time, four months afterwards, I could perceive no appreciable difference. I regret that I have no account of the yield of hay after the second and third cuts, but as nearly as I can arrive at the result, the total crop of hay of a hectare of land would weigh about 12,000 kilos., that is, if it were possible to dry the last cut in autumn. The hay preserves all the good qualities of the crop when green, and the cattle eat it with great avidity. Their condition is remarkable during the time they have this food, the secretion of milk augments and preserves the same quality as though they were feeding upon green food. The gathering in of the hay is just as easy as that produced from our meadows, but we must say that it has not so good an appearance as the latter, and it is much harder.

#### YIELD OF SEED.

The second cut of a hectare has yielded 65 hectolitres of seed. Presuming the first to be equally good, and I believe it ought to be better, that will give at least 130 hectolitres per hectare in a single year on the same lands. The seed of the *Bromus Schraderi* is very light, the hectolitre weighing only 20,350 kilos.—that is, about half the weight of oats, and a third of that of rye. If the seed, however, is light, the crop, by way of compensation, is extremely abundant.

#### YIELD OF STRAW.

The straw is very heavy, and though a little hard, it is consumed, uncut, by the cows, and especially by the pigs, who always prefer it to oat and wheat straw. On perceiving the avidity with which our animals consumed this forage

I resolved to make an experiment or so in cultivating it, in order to test its real value. I quickly perceived that this food had the best effect upon the condition of the milking cows; their milk sensibly increased, and their good health was remarkable.

M. Lavallo then gives a series of experiments as to the feeding quality of the plant, and their results chemically are stated. One, in relation to cows, we shall briefly recite. M. Lavallo says:—

“The milk of cows, fed for a month upon a good lattermath of lucerne, was closely measured, and the quantity of cream, per 100 parts, measured by a lactometer, was exactly estimated. I took the figures of three successive days, which were identically the same. Then we subjected the cows to the regimen of Brome, and I found an augmentation of 18 per cent. on the first day, but on the following days the figure was reduced to 10 per cent., at which it remained during the fifteen days of the same food. At the end of this period I again put the cows under lucerne food, and in forty-eight hours after the production of milk declined, little by little, by 10 per cent. The weight of lucerne and the weight of brome were the same.

“The milk, when the cows are fed with the *Bromus Schraderi*, has exceptional qualities, which the dairy-woman quickly recognises, both in the manufacture of butter and cheese. It is difficult to describe these qualities; the butter, for instance, in the hottest season, can be made much quicker, is harder, and keeps fresh longer. It has also a finer *goût*, and a much better appearance.”

## THE ACCIDENT TO SARAGOSSA, IN THE OAKS.—THE HAMPTON COURT YEARLINGS, &c.

(From the *Sporting Gazette*, June 4, 1864.)

TO THE EDITOR OF “THE SPORTING GAZETTE.”

SIR,—It happens once every few years that a horse fractures a leg whilst running a race, and though I have not sufficient data for positive assertion, I believe that the accident has happened more frequently on Epsom Downs, and in the races for the Derby and Oaks, than on any other occasion. Such accidents cannot be prevented, we fear, but it is well, notwithstanding, to look into the nature of the injury, to ascertain how it happens, and whether there are probable or remote causes which render the fastest and best horses liable to it. The accident occurs through the preponderance of muscular energy and power over that of the passive structures. From cases that have come under my own investigation, I think that I can see how the structures gave way in succession in the case of Saragossa. I learn from reports that she fractured her pastern, and also that she fractured her fetlock. Here is as much definition as we can expect to be given on the moment; and I happen to know that these cases have generally escaped a sufficient examination; and beyond the fact of a broken bone, nothing has usually been reported. I have no doubt that the first lesion which occurred was the tearing away of the long tendon from its attachment into the bottom of the coffin bone. This would happen by the bone itself giving way, some particles of it adhering to the end of the tendon. The instant this has occurred, the navicular bone breaks up into two or more pieces, and the small pastern bone splits into several longitudinal fragments; sometimes the long pastern bone goes in the same way.

Now, can we turn the last of these serious accidents to any account for instruction? We are told, where we are exhorted to seek for truth, that those who seek betimes shall find it. We never find this accident happen to a slow, bad horse, nor yet to one in inferior condition, for the simple reason that there does not exist sufficient energy and force to over-tax the passive structure.



There is, however, a double aspect under which the matter is to be viewed ; as well as great development of muscular energy—there is such a thing as weak condition of bone. In several of my papers, and especially in my prize essay in the “Royal Agricultural Society’s Journal” on the “Breeding of Hunters and Roadsters,” I entered extensively into the question of the influence of a firm soil and extensive range, in conferring texture and form to the bones and every other structure.

There is one source of information bearing on the subject, which lies within reach of the public ; it is that which the Hampton Court paddocks will supply. I would suggest that, in the interest of science, a report be made of the number of foals and yearlings which have fractured a leg whilst in those paddocks, making the inquiry extend over the last ten or fifteen years. If I am not greatly mistaken, we shall find a percentage of those accidents in all the stock that have been bred there, and that few years have passed without a recurrence, and those quite apart from any exposure to violence. We also find that the Hampton Court stock are subject to an enlarged state of the glands of the neck, so much so that it has been named the Hampton Court deformity ; it generally subsides after the stock has been placed in good training stables for some months. This glandular affection seems to me inseparable from some abnormal state of the constitution, and especially as connected with the condition of the bones. When facts have been made out, and the number of fractures that happen to the stock before they are put into training ascertained, a scientific investigation should be set on foot ; this should, I suggest, be conducted simultaneously by chemists specially versed in two branches of that science—viz., by the agricultural chemist, who would examine the soil, its produce, and also the waters, and by the animal and pathological chemist, who should examine the secretions, &c. Then comes the question of topography and space, concerning which my own researches are available for reference. If these inquiries were to lead to our ascertaining the causes, the nation would be enriched by their recital infinitely more than by the amount of cash which the Royal treasury would receive by any number of annual sales.

Without presuming to be well informed as to the average performance of the produce of the Royal paddocks, I can but think that we shall find the best of them—mostly two and three year old performers—smart horses, but few of them run on. I think that if we note all the stock from Moses’s year to the present time, we should not discover the like of Stockwell, Rataplan, Fisherman, Saunterer, Caller Ou, and the little dwarf Borealis. And yet no one can deny that some of the best mares in England have always been at the paddocks, and that a most judicious selection from the best stallions in the kingdom has always been made, irrespective of those kept on the spot from time to time.—I am, Sir, your obedient servant,

JOSEPH GAMGEE.

New Veterinary College, Edinburgh, 30th of May 1864.

## GARGET—CONGESTION OF THE UDDER.

(*From the Scottish Farmer and Horticulturist, June 8, 1864.*)

THIS is a common disease of dairy cows, occurring shortly after parturition, or it may be immediately before it, and attacking especially free milkers after their first gestation. In cows the womb and mammary glands receive their blood from the same large trunk—the posterior aorta ; whereas in the human female the glands obtain their blood from the anterior aorta. This may be a reason why the secretion of milk almost invariably becomes early and freely established in the cow ; but it also renders the glands very liable to over-excitement and disease. The abundant flow of rich and stimulating blood to the udder on the second or third day, and the active secretion of milk, usually lead to a certain amount of fever, with lassitude and restlessness, heat of mouth and diminution of appetite ; and this may pass by an easy transition into sanguine-

ous congestion or inflammation of the organ. If the milk is imperfectly drawn off, the condition will be fostered even though a certain amount is taken away; and a cow may soon be rendered all but useless through treatment of this kind at the hands of a careless dairymaid. Similar in kind is the vicious practice of *hefting* cows, which can only be characterised as a piece of wanton cruelty on the part of the vendor. Independently of hefting, the abundant supply of nutritive diet on the first few days after calving is a fruitful source of disease of the udder, as it is of the justly dreaded parturient or milk fever.

Perhaps no condition is more favourable than that in which the calf is allowed to suck its dam; but even in these circumstances the udder may become congested. The calf may be too weak to abstract a sufficient quantity, or the dam may obstinately refuse either to suckle the offspring or allow herself to be milked.

A number of external causes may favour the development of congestion. Wounds, blows, bruises in lying, prolonged contact with cold pavement, or exposure in a draught of cold air, may act in this way.

Sometimes the whole udder is affected, and sometimes one quarter only, but most frequently the two quarters on the same side are simultaneously attacked. The gland swells in a general and uniform manner; the skin covering it becomes tense and glistening; it acquires an elastic sensation and much tenderness. The swelling is not limited to the gland, but encroaches on surrounding parts as well, and frequently extends forward on the belly almost to the forelimbs. In some good milkers, after parturition, this symptom is quite consistent with perfect health.

In a short time the swelling of the gland loses its uniformity, becomes knotty at certain points, and acquires a soft and pasty feeling in place of its previous tense elasticity. The yielding nature of the swelling is readily distinguished from the fluctuation caused by the presence of matter or other liquid, and really depends on the effusion of liquid materials from the blood into the areolar tissue of the gland. Lameness is usually well marked; the hind limbs are kept apart and stretched backward, while in walking there is halting and inability to advance the leg upon the affected side. When standing, the patient frequently shifts her weight from one hind foot to the other. The secretion of milk is also sometimes modified. It acquires a grey or yellow tint, and a thin serous or glairy appearance, and it may even be in part coagulated, in which case it is mixed with small grayish-white masses of curd. Fever may or may not exist. It is seldom very marked, unless the gland becomes actively inflamed, when we have a much more serious condition to contend with.

The treatment must be in part directed to obviate the irritation resulting from the excessive secretion of milk, and in part to counteract the congestion. In the milder cases, a good hand-rubbing of the udder and due care to milk the animal clean, will attain both these ends. The rubbing may require to be repeated for several days before each milking; but by degrees, the swelling is reduced and softened, the skin reassumes its normal colour, and the tenderness disappears. The young animal acts in a similar way, withdrawing the milk, and, at the same time, subjecting the udder to an amount of friction which is in the highest degree beneficial.

It will sometimes be advisable to seek to diminish the secretion of milk by putting the cow on spare diet. It should be made a rule that cows, and especially such as are in prime condition, should be kept on spare diet for at least a week before and after calving. Were this more generally acted on, the diseases occurring about the time of parturition would be much less numerous. Besides low diet, it may be needful to give some depletion agent, such as nitre in ounce doses, or Epsom salts to the extent of a pound, combined with a carminative.

In more severe cases, frictions, with stimulating liniments, may still be employed, provided there is no active inflammation in the gland. For this purpose, camphorated spirit of wine may be used, or ammonia and olive oil, equal parts of each. In all cases it is of the greatest importance to have all the milk



removed. If the soreness of the teats prevents us from effecting this with the hand, the teat tubes must be employed by a careful attendant. Above everything, draughts of cold air must be avoided ; and if there is any tendency to coldness of the surface, the subject should be comfortably clothed.

It will sometimes be found necessary to use fomentations, poultices, &c. ; but these are rarely needed, so long as the condition is only one of simple congestion, and we may refer to their employment at another time when treating of inflamed udder.

## EPITHELIAL TUMOURS IN THE DOMESTIC ANIMALS, AND PARTICULARLY CANCER OF THE LIPS IN THE HORSE AND CAT.

(Communicated to the Imperial Academy of Medicine).

By CAMILLE LEBLANC.

(*From La Clinique Vétérinaire.*)

It is only a few years since veterinarians commenced to divide malignant tumours into two categories—true cancers and pseudo-cancers.

In this last class is an order of tumours composed almost entirely of epithelial tissue, which is frequently observed in the domestic animals, and which may be distinguished from true cancer by microscopical and clinical signs. As in man, epithelial tumours have certain places of election, as the skin, lips, tongue, penis, sheath, and vulva ; they are also found, in exceptional cases, on the inner coat of the veins, on the mucous membrane of the bladder and œsophagus, in the thyroid gland, and in the pelvis of the kidney.

Whatever may be the seat of these tumours, they agree in this, that they invade surrounding structures only by contiguity of tissue, and whatever may be the duration of the affection, there is, as a rule, no consecutive diathesis. In certain cases, there is some enlargement of the lymphatic glands in the immediate neighbourhood of the disease, and this may terminate in an epithelial degeneration. This glandular enlargement will at times supervene a few months only after the appearance of the disease, but is always long in being developed when the glands are distant from the point of ulceration.

Cancroid of the penis is very common in animals, and especially in solipedes. These have not been examined microscopically in all cases, but it is easy to establish the identity of those that have been so examined with those that have not. It suffices to compare the external aspect, the course and termination, in order to class all these morbid productions in the same category. The glans, and often the cavernous portion of the penis, become the seat of vegetations, designated *figs* or warts, and separated by deep ulcers filled with a greenish caseous material mixed with blood. The general appearance is that of a cauliflower, and they exhale a foetid odour. Rarely do the inguinal glands participate in the affection either by engorgement or by degeneration. No diathesis has in any case been found to result. If death has in some cases resulted, it has been solely on account of the impossibility of micturition, and the consequent rupture of the bladder.

If the tumour has recurred, it is only from the incomplete removal of the morbid product, which may have invaded the *corpora cavernosa* deeper than was supposed, and in all such cases a second or a third more complete operation will always effect a radical cure without any risk in any case of the disease becoming general. I abstain from relating those cases of cancroid of the penis recorded by veterinary authors. As a proof of the veritable nature of these tumours, I will cite from *Hanover* a case of epithelioma which had invaded the glans, sheath, and *corpora cavernosa*. It was a cauliflower growth, grayish-yellow externally, and white internally, with radiating lines extending from the centre to the circumference. In the midst of a non-elastic cellular tissue and

numerous vessels, were seen the papillæ of the skin covered with a large quantity of epithelium. The epithelial cells, as in man, are round, rarely ovoid, and contain nuclei and nucleoli. The peripheral cells are the smaller. Interspersed among the epithelium are numerous crystals of cholesterine. Outside this form of epithelioma, where the cells unite in cylinders, the mass may appear as a grayish-white stroma, easily torn, and inclosing a large number of round or oval bodies. This epithelioma of the penis has the same elements as epithelioma of the lips in man.

From the numerous observations found in veterinary publications, we observe that the horse and the ox are the only subjects of this affection, and in all cases there is the most perfect identity in form, course, and termination.

A case reported by M. Delorme ("Mémoires de la Société des Bouches-du-Rhône") bears a striking resemblance to a communication made by M. Broca to the Society of Surgery on 6th November 1860. In both cases, the operation was at first incomplete, and followed by a recurrence, whilst the second operation, in which a portion of the penis was excised, disclosed, in the canal of the urethra, rounded tumours composed, as in man, of epithelial cells; a third operation, in which these were removed, established a cure. These two facts, identical with two others observed by MM. Larrey and Cullerier, are remarkable for the absolute similitude of the course of cancroïd in different cases, and by the happy result of the third operation.

The sheath is also the seat of epithelial tumours, which acquire a considerable volume, and do not differ in their aspect from cancroïd of the penis. I have had occasion to excise one which had invaded the anterior half of this structure. The hot iron was employed to cauterize the parts, and a cure was effected. By microscopic examination I was enabled to establish the identity of the tumour with epithelioma of the penis.

Observations have been published, showing that cancroïd of the sheath is met with in the ox and the dog as well.

The female generative organs are also attacked by cancroïd, though only on rare occasions.

I think that an attentive examination will enable us to distinguish between these homœomorphic productions and true cancer, which often exists in the bitch between the lips of the vulva or on the neck of the uterus.

The tongue in the ox is the seat of a fibrous degeneration, characterised by hypertrophy of the organ, and accompanied by ulceration on its surface, from which a sero-purulent fluid escapes. The infrequency of their recurrence, and, above all, the absence of any diathesis, and the cure which almost always follows their excision, enables us to class these tumours amongst the epithelial growths. Hanover mentions a case of epithelioma of the fauces in an ox, and another of the tongue in a dog.

Cancroïd of the skin also exists in animals, but without microscopic examination they are not easily recognised by their simple external characters. In one which I recently removed from a bitch, and which has recurred, I found by the side of fibrous bundles a mass of epithelial cells, containing distinct nuclei and nucleoli, and interspersed with crystals of cholesterine and vessels. In St Thomas' Museum at London, there exists an epithelial tumour of the limb in a dog. Hanover considers *canker* as only an epithelioma of the plantar aspect of the foot, having found, on making sections of it, thick cylinders of epithelial cells united to a subjacent chorium, and extending its roots into the deeper parts. Gluge has described the same cylinders mixed with an amorphous substance; he has seen the papillæ in the form of the fingers of a glove, composed of a mass of cells with nuclei and nucleoli, and he does not believe in the possibility of a diathesis, but considers the affection as entirely local. In this, however, as in cancroïd of the skin, it is desirable that new investigations should be made, in order to distinguish these from the fibrous and fibro-plastic tumours that attack the integument of the lower animals.

M. Robin, on one occasion, noticed epithelial tumours on the inner coat of the



veins of a horse. We owe likewise to Mr Shorten the report of a very remarkable case of epithelioma of the bladder of a horse. The vesical mucous membrane was covered with vegetations of a reddish brown colour, and there was no appearance of a diathesis. Mr Shorten has reproduced, on a joint plate, the elements of epithelial cancer. (*Veterinarian*, 1855, p. 316.)

In the "Edinburgh Veterinary Review" (April 1862), Mr Gamgee gives the description of a degeneration of the œsophagean mucous membrane in a young bullock. There was no other lesion, and microscopic examination showed it to be a hypertrophy of the papillæ, with an abnormal production of epithelium. It is plainly an epithelioma, and is illustrated by two designs,—one of the tumour and another of its elements.

M. Rayer presented to the Biological Society, on 14th March last, the kidneys of a sheep, of which the pelvis contained epithelial tumours, their veritable nature having been demonstrated by microscopic examination.

Lastly, in a hypertrophied thyroid gland, the microscope has shown the presence in large amount of epithelial elements.

I pass, however, to that which is more especially the object of the present paper,—cancroid of the lips in the domestic animals. This has been chiefly seen in the horse and cat, rarely in the dog.

Laurentius Rusius, in his "*Traité d'Hippiatrique*" (chap. clxxi. p. 137), after having spoken of cancer in general, and of canker in particular, adds: "Item si cancer labium equi ceciderit semen canabis dessicetur valde et inde subtilissimum factum superponatur his in die donec equus sanetur."—"Likewise, if there supervene a cancer of the lips in the horse, we ought to dry hempseed, reduce it to a fine powder, and place it twice daily on the wound until cured." This is truly cancroid of the lips, and not aphtha, of which the author treats in a separate chapter. Since then veterinarians have passed over ulcerations of the lips in silence. M. U. Leblanc, in his memoir on cancer, has ranged the ulcerating tumours, observed on the lips of the dog and cat, under the head of pseudo-cancers, and has established their epithelial nature. In the thesis of M. Lortet, in 1861, entitled, "*Essai Monographique sur le prétendu Cancroïd Labial*," it is said that M. Lecoq, director of the Lyons School, has observed this affection in the dog and cat, without any other detail. It is very difficult to indicate the causes of cancroid of the lips.

In the cat and dog it is developed chiefly on a level with the incisors, and almost always on the upper lip, which is the strongest in these animals. This lip is more exposed to bites by animals of the same species, by rats, or other animals. In the horse the ulceration is usually developed at the labial commissure, and is often dependent on continued pressure from a badly formed bit. The appearance and course of cancroid, is different in the equine from the canine and feline races.

In the cat, cancroid almost always commences as a little tumour, situated, in the majority of cases in the upper lip, less frequently in the lower, and very rarely at the commissure, though at times it is seen in both lips at once. This fleshy excrescence rapidly gives place to an ulcer, of which the depth has a pale yellow colour, and the borders are notched, and of a lively red hue. The secretion of pus does not seem to be abundant, but is constantly removed by licking, which also prevents the formation of scabs. The ulceration increases slowly but uninterruptedly, the lips of the ulcer become thickened, and the prehension of aliments is difficult. After a time the intermaxillary glands become engorged, the ulcer gains the face, and the animal dies from want of nourishment. I have never seen any general disorder complicate this affection; it increases only by contiguity, and by infiltration of the morbid element into the surrounding tissues. The glands participate in the epithelial transformation, but only at an advanced stage.

Microscopic examination shows it to be not a cancer, but a cancroid of the lips. My own opinion would be of less weight, but I have submitted specimens to be examined by MM. Robin and Follin, both of whom confirmed my



opinion that they were well characterised epithelioma. This opinion is still further borne out by the slowness with which the disease advances, and the absence of diathesis, even when the animal dies of the malady.

Caustics are useless in this affection, being rapidly removed by the tongue. Excision of the ulcerated part, on the contrary, is at times successful. They often recur. Frequently when the wound is cicatrising, an ulcer appears in the cicatrix, probably excited in part by the constant licking, and scratching with the claws. At other times a portion of infiltrated tissue is no doubt left, as there is great difficulty often in removing the diseased parts, in consequence of the smallness of the lip. Cure is the exception, recurrence the rule. I expected little from internal treatment, nevertheless, in a case where the tumour had recurred after an operation, I gave morning and evening a gramme (15 gr.) of chlorate of potass dissolved in water, and a large proportion of milk. This was persevered in for two months, all local applications having been suspended, and ultimately the wound gradually lessened and healed, with a whitish cicatrix, leaving, however, a considerable notch in the upper lip. This cat kept well for three years, and died of old age.

I have since met with another case in which chlorate of potass was equally effectual.

In the horse epithelioma of the lips appears chiefly at the commissure of the lips, and it is difficult to ascertain how it commences. When called to see the patient we find a hard swelling at the commissure, at the depth of which is a deep ulceration, more or less extensive, and of a red colour, surrounded by a white areola. The induration soon gains the cheek and lips, afterwards the buccal mucous membrane gets ulcerated, and covered by vegetations of a mulberry-like aspect, of which the engraving of M. Lebert representing a papillary tumour of the lips gives an exact idea (Lebert, *Physiologie Pathologique*, pl. x. fig. 7). At the side of these vegetations exist deep ulcers filled with pus and saliva, mixed with the debris of aliments, and which exhale a foetid odour. At this stage of the malady, the intermaxillary lymphatic glands become engorged, but without that indurated character and close attachment to the bone which is characteristic of glanders, or of farcy of the lips. It is usually soft and badly circumscribed.

If the disease goes on, the prehension of aliments and mastication become impossible, and the animal has to be sacrificed.

Caustics are often useful in the horse, especially at the onset; the docility of the animal, and the possibility of restraining the movements of the tongue for some length of time, permit the easy employment of these. They are generally useless, however, in old standing cases; in these the excision of the ulcerated part is the only means that have a chance of success. When it has not gone beyond the commissure of the lips this is easy, but it is inapplicable when a considerable portion of the buccal mucous membrane is involved. A recurrence is to be feared if even the smallest portion of the epithelioma is left. It is a grave affection, difficult to cure, and, owing to the length of time required for its treatment, the expenses may surpass the value of the animal.

When we examine, under the microscope, cancrioid of the lips, we see that the superficial layer is formed of epithelial cells enclosing nuclei and nucleoli, the cells being of the pavement variety. The deep layer is composed entirely of hypertrophied papillæ, infiltrated by epithelial nuclei firmly packed together side by side, the largest being met with on the outside.

Amongst these papillæ are some epithelial cells containing one or two nuclei, crystals of cholesterine and some vessels. The general appearance is quite analogous to plates given to represent cancrioid in man and in animals.

M. Robin, whom I desired to examine one of these labial tumours, fully confirms my opinion as to their nature, and he is further supported in this statement by MM. Follin and Broca.

In the course of June 1863, M. Bouley sent me an aged bay gelding belonging to a hirer at Montrouge. This horse showed at the right commissure of the lip a large ulcerated wound, surmounted by fleshy growths passing the lower lip.



It extended three or four centimetres into the interior of the mouth, and was broader than long. On the left side the ulceration on the buccal mucous membrane was at least as extensive, but it did not pass the commissure. The left half of the lower lip was indurated. The intermaxillary glands, especially those on the right side, were swollen, though quite in a different manner from that which is met with in glandered horses. The treatment up to the present time had been without any good result.

I removed the fleshy masses and showed them to M. Robin, whose opinion I have already given. I cauterised the wound with nitrate of silver, to check the hæmorrhage, and directed the owner to employ the internal treatment. I sent him twenty powders of chlorate of potass, containing fifteen grammes each, with instructions to give one every morning in a soft mash. My directions were carefully attended to, and in the course of a month I could observe a marked improvement in the condition of the patient. The wound was narrower, the prehension of aliments was effected more easily, and the food, previously in part lost, was now almost entirely swallowed after a perfect mastication. The same dose was continued during the months of July and August. At the end of the latter, the ulcerations of the lip and buccal mucous membrane were cicatrised, and there was only left an induration of the cheek and lips. The intermaxillary glands were scarcely perceptibly swollen.

I did not see the horse again, as the owner had sold him to a grain-dealer at Seine-et-Oise, whose name I did not learn. The owner had sold him to advantage, and without mentioning the disease of the lips, so that he objected to furnish information whereby I might trace him. It proved that the cure was well advanced at the time of sale, but, to my great regret I am unable to say whether the disease recurred.

A second horse, at present under treatment, has ulceration at both commissures of the lips, the characters being the same as those I have already described. The cancrioid has affected the buccal mucous membrane, extending two or three centimetres into the mouth. The edges of the ulcerated portion are notched, and the surface is covered by vegetations of a bright red. The submaxillary glands, especially on the right side, are manifestly engorged. The dose given for twenty days was twenty grammes a-day, and I increased it to thirty for three weeks. M. Bouley and myself saw the patient the day before yesterday, at which time the wound on the left side was cicatrising rapidly. There existed round the ulceration a whitish cicatricial tissue, which occupied almost the entire left commissure. The glands on this side were very noticeably diminished in size.

On the right side I have cut deeply into the substance of the lip, to determine the nature of the malady. The cure progresses but slowly, and the glandular enlargement persists. But I am satisfied with the healthy aspect and the gradual narrowing of the wound.

*Resumé.*—Epithelial tumours are frequent among animals.

If they are compared with epithelioma as observed in man, it is easy to prove that they occupy the same seats, progress in the same way, and are composed of the same elements.

In animals, epithelioma spreads by contiguity, and is never seen to terminate by a diathesis.

Cancroid of the lips is most frequently met with in the cat and in the horse. In the first it fixes by preference on the side of the upper lip, in the second at the commissures.

The causes are little known.

This affection is liable to return, and the issue is very doubtful. Its treatment is very difficult by surgical means, such as the employment of caustics or excision.

The internal treatment consists in the long-continued use of chlorate of potass, the happy results of which we have given, though further confirmation is required to establish its value.



## INFLAMMATION OF THE UDDER—MAMMITIS.

(From the *Scottish Farmer and Horticulturist*, June 22, 1864.)

CONGESTION of the udder, when not relieved, will often run on into inflammation. The causes of the latter are accordingly the same as those of the former. Hefting, imperfect milking, too great dragging on the teats by inexperienced and faulty milkers, exposure to draughts of cold air and to wet, blows, bruises, and other injuries of the udder, and indigestions, are all productive of this affection. A troublesome and destructive form sometimes occurs among ewes and even cows that are left in the pastures over night, and seems to be connected with some peculiarity of the season—such as cold and wet—and on the quality of the herbage. Disease of the teats will sometimes lead to its development,—as, for example, when they have been injured by the improper and careless employment of teat tubes, or when they are covered with vesicles or raw sores consequent on murrain, or by large and tender warts, or the pustules of cowpox. It occurs at times along with certain other diseases, and seems to depend on a transition, or rather an extension, of these to the udder. Thus, it may coexist with certain forms of rheumatism; and certain intractable cases, showing a strong tendency to end in gangrene, are associated with disorders of the digestive organs of the womb or vagina.

The disease is very common in heavy milkers at their first or second calving; but it may occur at any time, and even in virgin heifers which have never given milk.

Mammitis is ushered in by a shivering fit, staring coat, and general coldness of the skin and roots of the horns. This is more or less intense and prolonged, varying in duration from two to twelve hours. This is followed by a hot stage and active fibrile symptoms, proportionate in degree to the length and violence of the previous shivering, and the extent and activity of inflammation in the gland. There is considerable dulness, hanging of the head, inappetence, irregularity or suspension of rumination, heat of the surface, bloodshot eyes, hurried breathing, arched back, and costiveness. The pulse beats faster, and with a greater volume and force.

The condition of the udder varies according to the parts affected. In that form which attacks chiefly the cellular tissue surrounding the gland and the lining mucous membrane of the lactiferous ducts, the swelling is uniform, without any hard, knotty masses at first. The hardness and tension of the gland vary with the degree of inflammation, and the swelling is greater in proportion as the lactiferous ducts are implicated. The teat is enlarged and tender, and on manipulation the inflamed milk-duct is felt as an indurated cord. Continuous with this, at the base of the teat are diverging hard cords representing the inflamed milk reservoir (*galactophorous sinuse*) and the ducts which convey the milk into it. The surface of the udder and teats is red, hot, and extremely tender, as evinced on manipulation, and especially on any attempt being made to milk the patient. The hind limbs are stretched out behind, and the gait is reluctant and straddling, to avoid friction or compression of the gland between the thighs. The loins are stiff and rigid. As in congestion, there is generally serous effusion into the surrounding parts, and the swelling consequent on this may extend between the thighs as far as the vulva, and forward to beneath the breast-bone. The milk is either entirely suppressed, or is diminished in amount, watery, dirty-white, or greyish, curdled, or even bloody.

In the form which affects the true gland tissue, the diseased quarter is uniformly swollen, very hard and painful, and the skin, though hot, tense, and smooth, has not the same redness as in the variety already mentioned. The tenderness of the parts, and the general constitutional disturbance, are much more intense than in that variety. There may be nodular or corded swellings at the roots of the teats of the affected quarters, but the teats themselves are not usually very tense or swollen. On drawing the teats of the diseased quarters, often nothing is obtained; at other times a redish serous fluid, or even pure blood, may be withdrawn.



Inflammation of the udder may terminate in a gradual restoration to the healthy state, in chronic induration of the gland, in suppuration, or in mortification.

Under the use of appropriate curative measures the inflammation is reduced, the inflammatory exudations removed, and the gland is restored to its healthy functions. It is not always that we can expect such a favourable termination. Very frequently the exuded lymph becomes organised, and is not absorbed on the subsidence of the inflammation; but a portion, or the whole of one quarter, or even more, remains hard and indurated, the secretion of milk is not re-established in this part, and if part of a quarter only is in this condition, the milk may not only be reduced in quantity, but also at times bloody. When the inflammation runs higher, there is a strong tendency to suppuration. About the eighth or tenth day a circumscribed part of the skin becomes more tense, and assumes a more livid redness; while, by careful manipulation, a distinct fluctuation may be made out, due to matter formed in the deeper parts of the gland. If not evacuated by the lancet, the skin and subjacent structures are gradually attenuated, and the matter discharged externally; or, if situated near the lactiferous sac at the base of the teat, it may open into that and be discharged through the teat. In certain cases the inflammation is so violent that it is rapidly followed by gangrene of the affected parts. The skin, in the course of a day or two, changes its red colour for a dark or violet hue, and, if it only is affected, gets dry like parchment, and may be thrown off by ulceration after a short time. If deeper parts are implicated, and especially if the gangrene is spreading, the dead part is surrounded by a soft puffy swelling, which crackles on being touched, in consequence of the extravasation of gaseous matters beneath the skin, and the progress of the gangrene is marked by a livid circle, within which the parts are cold and insensible. In the ewe, the whole gland may become gangrenous and drop off at once, the last attaching portions being the blood-vessels and some fibrous bands. In the cow, on the other hand, it is more usual for the gangrene to advance slowly; a superficial part gets detached, and a clear foetid discharge is established; which becomes more abundant as the mortification extends to the deeper seated parts. With gangrene there is always great prostration of the vital forces, a quick, weak pulse, and, if the patient survive, a rapid emaciation.

The treatment will vary with the stage and form of the malady. If noticed in the shivering fit, and before inflammation has taken place, a draught may be given composed of hot gruel, or even water, containing an ounce each of ginger and coriander seeds. The back may be subjected to an energetic hand-rubbing with wisps of straw, and the body warmly clothed. The patient may then be kept on short diet, have warm water injections occasionally, and have her milk drawn off. In many cases these simple measures will check the shivering and arrest the disease at its outset. In many cases it will be advisable also to give a purgative, either with the stimulant or afterwards, and to allow as much chilled (not cold) water as the animal will take.

After the shivering fit, or even during its continuance, when the udder has become inflamed and swollen, it will be necessary, besides an active purgative, with hand-rubbing and clothing of the body, to pay the greatest attention to the udder. In that form which affects the superficial parts of the gland, cold and astringents are often employed with benefit. A large supporting bandage, with holes cut in it for the teats, is maintained in position by two bands passing from its anterior border, attached to a roller passed round the loins and carried between the fore limbs to get fixed to a flattened band put round the neck in the form of a collar. Two other bands from its posterior border are passed between the thighs, brought up one on each side of the tail, and carried along the back to be fixed to the roller and collar strap. This bandage can be so attached as to give support to the udder, and thus materially relieve the suffering. Between it and the gland are to be placed pledgets of tow kept constantly damp with cold water, a solution of nitre, or, better still, of sugar of lead, in the proportion of half-an-ounce to the quart of water. Should the symptoms indicate that the gland tissue itself is affected, fomentations and poultices are indi-



cated. To effect any good with fomentations, however, they must be continued uninterruptedly for an hour or more each time, and repeated three or four times a day. The water should be made so hot that the hand cannot be kept in it for any length of time, and the heat should be kept up by the frequent addition of water at a higher temperature. A blanket folded to a convenient size is an excellent means of applying it to the udder; and to do this thoroughly two persons are requisite, one placed at each side of the cow. The bucket containing the water is set beneath the udder, and the blanket, after having been soaked in it, is firmly applied against the gland, so as to suspend and support as well as foment it. It will retain a sufficient heat for about ten minutes. After the fomentation, the inner side of the thighs and the udder are to be rapidly dried, and a large warm linseed-meal or bran poultice applied, with the bandage already mentioned. If a poultice cannot be put on at once, the swollen parts may be rubbed with the stimulating liniment recommended for congestion of the udder, and the suspensory bandage applied alone. Mechanical support of the gland is of more consequence in this variety than in that affecting the superficial parts.

When suppuration takes place, it must be opened with a lancet; but if this is done too soon, indurated masses are liable to be left surrounding the sac of the abscess, whereas, if left too long, or allowed to burst of its own accord, it may open into one of the milk ducts, or the skin covering it is to a considerable extent thinned and destroyed, so that it heals only tardily and with difficulty. The best general rule is to make a free dependent opening as soon as the fluctuation is well marked. The discharge may be favoured by fomenting the udder, and the factor of the matter counteracted, as well as the walls of the sac slightly stimulated, by injecting a saturated solution of chloride of lime. Solutions of the sulphate of zinc, and other stronger stringents, may at times be required.

If the gland has become indurated, whether with or without suppuration, and if no more active inflammation exists in the glands, iodine ointment, made so as to contain a drachm of iodine in every two ounces of lard, may be rubbed over the part daily. In obstinate cases, it may be requisite to administer iodine internally as well.

If gangrene ensues, a quarter or more frequently a half of the udder is lost. As soon as the mortification is noticed, the dead parts should be freely incised, and washed once or twice daily with a solution of chloride of zinc, in the proportion of a drachm to the pint of water. Should a whole quarter be rapidly destroyed by gangrene, as frequently happens in the sheep, its removal may be hastened by dissecting out the diseased parts from the healthy. It is to be recommended to pass a ligature round each of the large vessels before dividing them. In tying the arteries, some care is required, as their walls are often thickened and friable as the result of inflammation; and if torn through and still not quite impervious, troublesome bleeding may ensue. After the removal of a large gangrenous mass, the cavity may be filled up with pledgets of tow soaked in a solution of chloride of lime, or in the zinc solution already mentioned. The strength, too, will require to be supported by a liberal diet, and by the employment of stimulants and tonics; and the same measures will be advisable in those cases in which profuse suppuration has been established.

---

## OBITUARY.

### PROFESSOR MILLER.

ON Friday morning, 17th June, Professor James Miller died in Edinburgh. The painful duty has devolved on us of recording the death of a distinguished surgeon, who, by the interest which he took in the progress and welfare of the veterinary profession in Scotland, had won special claims to our gratitude and esteem—of a man whom we all revere as having added to high professional attainments a kindness, gentleness, and urbanity, which secured for him the love and respect of a numerous assemblage of pupils, patients, and admiring friends.

It is a pleasant task to study the lives of the great and the good men we have



lost, and to inquire into the causes of their greatness and their success in life ; it is most pleasant to do so when those whose loss we deplore have left a name not only respected, but loved. Often the biographer has to show that the subject of his notice did not, during his lifetime, meet with the success which ought to have fallen to his share ; this is not our task, for the man to whose career we now draw attention was eminently a successful man.

At the time of his death, Professor Miller was only fifty-two years of age. He had, nevertheless, already attained to a high professional position, and occupied some of the most distinguished posts to which the ambition of a surgeon and scientific man can aspire ; for, in addition to the Professorship of Surgery in the University of Edinburgh, he was Surgeon in Ordinary to the Queen, for Scotland ; Professor of Pictorial Anatomy to the Royal Academy ; Consulting Surgeon to the Royal Infirmary, Royal Hospital for Sick Children, &c.

James Miller may be truly said to have been, in early life, placed under the most favourable circumstances which could conspire to fit a man for a professional position. The son of a clergyman, who was in every way qualified to conduct the education of his sons, his early studies were carried on in the quiet of a country manse, where his companions were the sons of the Earl of Panmure, who had been placed under the care of his father.

There is nothing which specially calls for notice in that part of Professor Miller's life which extended from the time when he left the Forfarshire manse, to enter upon his more advanced literary studies in the University of St Andrews, to the time when, having gone through the usual medical curriculum in the University of Edinburgh, he formally entered the medical profession, and became the private assistant of Robert Liston. This distinguished surgeon was then in the zenith of his fame in Edinburgh ; and the young assistant could not fail, with such a master, to become a good surgeon, and at the same time to form an extensive and influential connection. After Liston had risen to great reputation in Edinburgh, he determined on moving to London, and in doing so, he left behind him an assistant who, by his professional fitness, and his amiable and winning manner, had secured for himself an honourable and independent position as an Edinburgh surgeon. After his master's departure (1834,) Miller rose rapidly in public favour, and we find him in 1842, when only thirty years of age, elected to succeed the distinguished Sir Charles Bell in the Chair of Surgery in the University of Edinburgh. His career was thenceforward highly prosperous. About this time he published a work, in two volumes, on the " Principles and Practice of Surgery," which acquired considerable reputation, being considered one of the best systematic text-books on the subject, in the English language, and which before his death had attained a fifth edition. Although this was his chief work, he was known for many important contributions to general as well as medical literature, and especially for certain publications on subjects of great social interest. From the time of his being elected Professor of Surgery to the time of his death, he steadily attained to all the positions which have been referred to as held by him. Did time permit, we should feel pleasure and satisfaction in referring more in detail to the chief points of interest in his life ; but it is to his connection with the Royal College of Veterinary Surgeons, as President of the Examining Board for Scotland, we wish particularly to refer.

It will be fresh in the memory of his colleagues, and also in that of the candidates for the diploma at the Examining Board, as it is in our own, with what urbanity of manner, and with what scrupulous exactness the whole proceedings were conducted, under the leadership of a man so zealous as he was in all good works.

The parting words of encouragement and advice which the late Professor Miller annually addressed to the young veterinary surgeons, as their diplomas were handed to them, will be lastingly engraven on the memories of many now widely dispersed over the world. On our own part, and that of our brethren, we condole with the bereaved family who now mourn the loss of so good and wise a head.

# EDINBURGH VETERINARY REVIEW

AND

## Annals of Comparative Pathology.

---

### ORIGINAL COMMUNICATIONS AND CASES.

---

*The Breeding and Management of Horses.* By JOSEPH GAMGEE,  
Senior, New Veterinary College, Edinburgh.

It seems reasonable to believe that much of the same innate love for horses, and acquired knowledge of the animal, is necessary for their systematic production, as is found essential to their maintenance in health and perfection, to fit them for the diversity of uses which they render to man.

Our country is gifted beyond all others for its congenial climate and soil, for producing horses of every description, and no other people make such extensive use of that noble animal relative to the extent and population, as the English do; nay, we may go further and say, that none have such magnificent horses, adapted for every conceivable purpose, under saddle and for harness, as are to be found in the British isles.

Having expressed my views on "The Breeding of Hunters and Roadsters" recently, I should not have ventured to take up the subject now but for the public attention and much correspondence which it has lately elicited.

The address, to her most gracious Majesty, presented before Lord Palmerston by the President, Vice-Presidents and Council of the Royal Agricultural Society of Ireland, on the alleged deterioration of their breed of horses, was of itself a step taken by a corporate body and sanctioned by names, calculated to stir inquiry; and doubtless the First Minister of the Crown took the right, and a wisely determined course, when he announced to the Noble President who headed the deputation from Dublin, that "there does not appear to be any good ground for the appointment of a Royal Commission to inquire into the matter."

Whilst, however, it seems to be good policy on the part of Government not to undertake any charge in connection with such an extensive department of the business of every proprietor in the land, as that of horse-breeding involves, it is quite con-



sistent with the alleged statements, that there is a case requiring much attention, the main question depending is, on whom must the business devolve? The brief and correct answer implies, on the intelligence and industry of the owners and tenants of the land.

The letter which the Right Hon. Sir R. Peel addressed to the Hon. Admiral Rous, drew forth an exposition of several causes which tend to make good horses scarce in Ireland, and was so far good and well-timed.

The course having been determined on, and the reply given, there still remained the more important question as to what amount of reality exists in the state complained of regarding the insufficiency of resources, to keep up a supply of good horses equal to the demands, and Admiral Rous, in a second letter addressed to the "Times," gives a glowing account of the present high form of English blood-horses, and states that "the deterioration of horses is a pure fiction." General Augerstein, on the other hand, and other correspondents of the "Times," take a very different view of the matter, and so urgently are facts and arguments put forth, becoming in some measure the importance of the subject, that no individual opinion can prevail in the absence of evidence, in support of the premises adduced by those who have raised, or sustained the discussion.

Admiral Rous says, "We have succeeded in establishing a breed with one-fifth more speed and more strength than the original stock—an increased average stature from fourteen hands to fifteen and a-half—in thirteen generations from the first imported stallions, Darley Arabian, and Byreley Turk, without a drop of mixed blood."

It would be out of place here, and an incumbrance, to introduce the pedigrees in full of any number of horses, however small, and I have therefore adopted a simple plan of going the nearest way over the line of descent, beginning with a race-horse of the present time, and retracing his line through his sire to the remotest ancestor in the thirteenth generation; I have selected three horses for the proof, which I have done in the order of their merits, viz., the three best three-years-old colts of this season. Thus we take a glance back and find

Vermouth, by Nabob, by Glaucus, by Partisan, by Walton, by Sir Peter, by Highflyer, by Herod, by Tartar, by Partner, by Jigg, and that Jigg was by the Byreley Turk and his dam, by Spanker, and it is said that Jigg was a common country stallion in Lincolnshire till Partner was six years old, who brought him into renown.

Blair Athole by Stockwell, by the Baron, by Birdcatcher, by Sir Hercules, by Whalebone, by Waxy, by Pot-So's, by Eclipse, by Marsk, by Squirt, by Bartlets Childers, by the Darley Arabian, and the dam of Childers was Betty Leeds by Careless.

General Peel, by Young Melbourne, by Melbourne, by Humphry

Clinker, by Comus, by Sorcerer, by Trumpator, by Conductor, by Matchem, by Cade, by the Godolphin Arabian; and Cade's dam Roxana, was by the Bold Galloway, who was by a Barb horse, out of a royal mare.

The above sketch of the character of the male ancestors of three young race-horses, taken, as far as their pedigrees go, at chance, may be regarded as an average, such as would be exhibited by any twenty-five thorough-bred horses or mares taken at random from the stud-book. Readers who have not given much attention to breeding and the pedigrees of blood-horses, should not attach importance to the apparent near relationship of one horse to another of given renown, in the past century, viz., to Eclipse, Herod, Matchem, or either of the two Childers horses, because only a fractional part of the whole is shown in this sketch, and it will be found that with sires and dams a complete blending of blood of the best old stock of English horses has been carried on continuously; and that in almost every case, as in the instance of the three taken, we trace back to the nearest Eastern blood from our time, brought in by the Godolphin Arabian, which happened about as often through the dam as in the cases of Eclipse and Highflyer, as through the male line seen in Matchem's case, who was by Cade, a son of the Godolphin Arab.

I find that by most pedigrees, we trace back to Matchem, Herod, and Eclipse, or to the renowned sons of these horses, in about the ninth generation, and to the Godolphin Arabian about the eleventh, whilst through one of the brothers Childers, the Darley Arabian and Byreley Turk blood, is reached in about the thirteenth generation; and in every case, or at least the exceptions are so few that they would not be difficult to cite, the dams of our old English stock, possibly pure descendants from Arab horses, appear to have been as much English then as those of the present time are now. The blood of the three Arabian or Barb horses mentioned above, viz., the Byreley, the Darley, and the Godolphin Arabs or Barbs, came in the order of time,—not connected, but like small streams into a river, and for all that I can discover, Old Betty Leeds, Roxana, and the dams of (Croft's) Partner, and old Jigg, were as much English mares as are Queen Mary and Pocahontas, who likewise are descended from Oriental stock, of anterior times, no doubt.

It is not from any predetermined notions respecting the influences which particular crosses with the Oriental stock has exerted on the breeds of English horses, immediate or remote, but to expose and elicit truth—get at facts, and let argument rest on them, that I am working for.

When gentlemen, from different motives, after being convinced that good horses for special purposes are annually becoming more scarce, bestir themselves, and are told by a great authority that their complaints are founded on imaginary and not real



grievances, it becomes justifiable and necessary to investigate the subject farther, to ascertain to what extent we have been misled or have deceived ourselves.

If the history of English and Irish horses is taken up, it should be most carefully and impartially analysed, as far as the inquiry extends. Few horse-breeders, or general readers, are easily led to inquire fully into the subject, or ever contemplate it, beyond the point to which their memory, or local traditions, guide them. And probably, for all practical purposes, the present century would furnish material and comparisons sufficient for their future guidance. But once take it up, so that presumedly every important incident has been finally traced to its bearing, then let it be done so, that the whole may be referred to with intelligible effect.

Any one who undertakes to make the history of the English race-horse take its origin from the beginning of the eighteenth century must fail, because it is beginning at a point where a high standard of perfection had been reached, after many centuries of progress, with probably periods of interruption.

When, the Eastern horses were first imported into Britain, I fear no future historian will be able to tell us; but that it was neither in the eighteenth, nor two previous centuries is quite clear. Without, however, going back to the days of the Cæsars to inquire how the breeds of horses were, and whether importations of them took place then, or even taking into account the reign of King Athelstane in the tenth century, we will begin with the time of Henry VIII.

In Mr Berenger's history of horsemanship he quotes a passage from a Latin poem by Sir Thomas Chaloner, ambassador from Queen Elizabeth to the Court of Spain, date 1579, in which the ambassador "Censures the ignorance and folly of his countrymen in neglecting to promote a race of valuable horses in their own country, which, from the many superior advantages it enjoys, he says was capable of furnishing more beautiful and useful breeds than those of foreign parts, *from which they were so fond of being supplied.* . . . He therefore recommends the separation of mares, which should be confined in parks and enclosures, where they may run secure and unmolested. Hence he takes occasion to proclaim the praises of Henry VIII. for the attention which he paid to horses, and for his zealous endeavours to stock this nation with a variety of breeds for different purposes, by importing the finest, both horses and mares, from Turkey, Naples, Spain, and Flanders."

Here, then, we have related, on the best of historical evidence, that Eastern horses and mares had been imported plentifully during the early part of the sixteenth century, whilst there is nothing to lead to the inference that this was the first of such importations; on the contrary, it was certainly not the beginning.

There is no century, and probably no reign since those first referred to, during which horses were not imported. The Arab brought over by Mr Markham, and sold to King James the First, is known to all who consult the stud-book. And here again inferences may be drawn favourable to the state of perfection of the English horse, from the opinion which the great Duke of Newcastle formed of that Arabian. He describes him as "A little horse, of no rarity of shape." This Markham Turk is described as "the first of that country which England had ever seen," meaning, of course, not the first Turk or Barb horse imported, but the first from a given part in the East, supposed, probably, to furnish horses of special high qualities. This may be inferred, since it was known to writers that numbers of Oriental horses had been imported, mostly coming, in all probability, through Spain or Naples.

The interest which Charles II. took in the improvement of the breed of horses, and especially of his sending his Master of the Horse abroad to purchase stallions in Africa and Southern Europe, and that he collected a number of mares of the best blood procurable, which constituted the royal stud, and have since then been referred to as the Royal Mares, are commonly known incidents.

Assuming that for a time Arab and Barb stallions were exclusively used at the Royal Stud, the mares it is generally believed had been mostly bred in England, and we are unable to learn from any published authority, assuming them to have been of Eastern descent, how many generations of their race had been bred in this country since the importation of the first stock.

We see, by reference to reliable historical authority, that, as well as horses having been imported from undefined epochs, Henry VIII. encouraged men skilled in their management to come over to this country from abroad; and, from inferences, again we may understand that with the cultivation of the breed of horses at any given period, the eagerness of the affluent to avail of their services would progress also; and, accordingly, the king to whose time and reign we are referring, seems to have left nothing undone to effect his object.

Richard Berenger, Esq., amongst his unparalleled stores of instructive references on questions relating to horses and horsemanship says, speaking after the Duke of Newcastle, "This useful and becoming art began, or rather revived, about this time in Naples. The person who first taught it there was Pignatelli. And Henry invited two Italians, who had been his scholars, into England, from one of whom descended the Alexanders, whose scholars filled the kingdom with horsemen. The king likewise had an Italian farrier named Hannibale, who was looked up to by his English brethren, and taught them more than they knew before."



During the short reign of Edward VI. (1547–1553), we are told that horses were highly valued, and that laws were made for their protection, by which “provident and judicious measures the English breed of horses was not only improved in strength and size, but greatly increased in number.” Public races, we are told, were at the time referred to, already established at different places in Yorkshire, at Croydon, and some other places, and they were performed nearly under the same rules and upon the same principle as now (middle of last century), running by all the discipline of food, physic, airing, sweats, and clothing, which composes the present system.”

Charles the First kept up the encouragement of improving the breeds of horses, and increasing the means of bringing them into more extended use. The fondness of the French, which began in the preceding reign, continued in this, as appears from the following extract from the printed journals of the House of Lords, viz., “date 26th July 1645. It was moved, at the request of the French agent, that a pass may be granted for transporting twelve horses and two mares into France for the Duke of Orleans; and it is ordered that he shall have leave to transport twelve horses, but no mares, as there is a statute against it, and the concurrence of the House of Commons is desired therein.”

In a paper on English horses in the Edinburgh Review for the current quarter, which has just come under my notice, I find that the writer has been at much pains to quote from reliable authorities of old, material which may interest and instruct some readers on this subject. The essayist above alluded to, in speaking of the recent outcry about the deterioration of English horses, refers to several epochs to show that these alarms are of a periodically occurring character; and for my own part, I admit the fact, and see good reasons for its being so. All partial measures lead to extremes, which in their turn awaken fears and call for remedies. Thus the best judges of horses of their time, the Duke of Newcastle amongst others, have complained of the too indiscriminate use made of the small foreign stallions when the nation was in want of strong horses for war and commercial and agricultural work. These complaints have been common throughout our time and have been either general or local; and of necessity will continue to be heard from time to time with every possible claim to a calm hearing.

What art, we would respectfully ask is there, that could long prosper under silence and indifferent contentedness? Even the oldest of all, that of agriculture, which was thought to be in a satisfactory state in our childhood, has since then been greatly changed, and is now understood to be susceptible of indefinite additional improvement, but horse-breeding is far from being in such a systematic and progressive state. We have no necessity to tax our memories, nor go far back to be able to point out in-

stances where individual men have exerted much influence on no inconsiderable part of a district on the character of horses bred there, and such isolated influences multiplied, and brought to harmonise, in a few years work such changes on the general character of horses produced for various purposes, as the experienced Mr William Dickinson mentions in his paper on "The Breeding of Horses," deterioration or improvement ensues according to the means adopted—a stationary condition is impossible in such an art. I will give one instance to illustrate the above statements. The late Sir Tatton Sykes may be referred to, whose name is revered by all who knew him, as a benefactor to his district, which he raised to increased agricultural productiveness and prosperity. Now to say a word on his horse-breeding—the art above all which was the delight of his whole life; Sir Tatton's estates being situated amidst the greatest horse-breeding districts in the modern world, and the country being especially adapted to produce horses of the largest size—fine carriage-horses, weight-carrying hunters, and horses of the rarest stamp for army purposes. Sir Tatton, however, bred entirely from blood-horses, ostensibly for hunting purposes, and to which, in early times, they were destined. Some good half-bred mares were originally amongst the stud, but thorough-bred stallions, and very good horses too, being alone used, whatever there was of the breed of the old English hunter in their form, in successive generations altogether disappeared; but the baronet delighted in a blood-horse, and as he rode little over twelve stone weight, he could be mounted to his mind from his thorough-bred produce; hence, accordingly, his stud was moulded to his taste.

Had Sir Tatton been a man who rode sixteen stone, it is probable that his horse-breeding tastes would have been formed differently, and that he would have cultivated and patronized the production of more weight-carrying horses than he bred, and not have restricted himself to the pure-blood class. Such difference, which accident might have brought about, in the aims, patronage, and precepts of a gentleman of Sir Tatton's earnest and admirably persevering character, would have influenced the minds of horse-breeders from the Humber to the Tees. Notwithstanding the hints thrown out at present, by which we are told that some men have been complaining at all times that the stamp of horses were less powerful in their day than at some antecedent period, I am disposed to use my own experience, in a great measure for my guidance; and since it is in accordance with physiological laws and common sense, I see the greater reason for recording my views individually. I recall to mind the horses I have seen carrying men to hounds, of seventeen stone weight, who could through their good riding, keep in as good place as the eleven stone men, less brilliantly mounted, on light horses. I also remember the time prior to 1820, when Mr



Richard Gurney possessed three or four such weight-carrying horses as could with difficulty be found now ; those animals were about sixteen hands high and well bred—off a breed very much of a distinct character. They were fast enough for any use, and could carry their heavy master over wide hedge and ditch fences or timber in all forms such as a good sportsman would take, and I never heard of their rider getting a fall or missing to see the best of the sport in the field, however fast or long the run. I remember hearing Sir Charles Knightley's and Sir Francis Burdett's hunters favourably spoken of at the time, and that the latter baronet offered Mr Gurney twelve hundred guineas for his gelding Sober Robin, the price, at the time, of a high class race-horse. None but a special class of mare could ever be expected to produce such horses as those I am referring to, and whether these were from thorough-bred stallions, there being at the time excellent half-bred horses travelling in the country, it would be difficult to prove. I think it could be laid down as an axiom that no particular form of horse can be kept up without the requisite characteristic qualities in both stallions and mares of that particular class be maintained. To keep on discussing the matter on the basis that the thorough-bred horse is always to be the sire, when stock of more substance than the average blood-horse is the object desired, without making any provision for the maintenance of a plentiful relay of good mares and stallions for the purpose, seems absurd.

If a dog-breeder thinks that he can increase the stoutness of the greyhound by introducing the cross of the bull-dog, he will take care that both specimens of the species shall be pure and perfect of their kind. When, however, the new breed has been brought in, and the object attained, the experimentalist goes on reproducing from the mixed breeds ; but if he had frequent recurrence to the bull-dog for new blood, he would never catch his hare. Likewise, if the Norwich banker in after years had determined on trying to breed his own hunters from blood mares and his reputed race-horse Sir Francis, he would have had to draw deeply from the coffers of his bank before he could have found in his stable a number of such hunters for carrying weight as those referred to.

Some years ago I was speaking with the late Mr John Elmore on this matter, relative to the probability of keeping up the formerly powerful stamp of hunters in the absence of any intelligible system. This conversation took place when he was taking an active part in the great steeple-chase system, of which he was one of its promoters. He had already owned Lotery, the half-bred horse, and other winners, and he had then come to the conclusion that steeple-chasing was assuming a character such as would make it work injuriously to the breed of hunters. He said the clever half-bred hunter which could carry his rider to hounds

would not be appreciated, since the cast-off from the racing stable, such as was of little worth for after purposes, would always defeat him. And I think I have seen that (Elmore's) views of twenty years ago have come to pass. I can remember when beautiful half-bred stallions were to be found varying in class, and then, as a matter of course, mares of analagous substance were found in abundance. When we think of the half-bred Presidents, descendants of Sir Mark Sykes' blood-horse of the same name, and look at the apology for a first-class half-bred stallion shown under the same name the other day in London, it is with the feeling of conviction that this last would have been no competitor with those of the past; and when we look on the dumpy, heavy class of half-breds shown with him, we are led to reflect back twenty-seven years, when we saw Merrylegs first appear in the market places of Yorkshire, and we look at that horse through time, whose stock has realised wealth to many a horse-breeding proprietor. In his case we had no butcher's trotter, but a grand gentleman's horse, his performances were so equally good that the owner of old Merrylegs challenged to compete with any horse in England, in all three paces, the best in two of which he was almost sure to be.

I am convinced that the cultivation of the blood-horse may fairly be left to the custody of those who breed for turf purposes, either like their forefathers, with the view to improve the national excellence of horses, or from any of the motives in operation to encourage breeding. Some of the questions will settle themselves with time, but parts of the present plan are only on trial, and may or may not be found to answer. I allude to the studs with annual sales of yearlings. The blood-horse just now seems to have no standard or average value,—that depending on the speculative aims of buyers. Breeders will, to a great extent, be guided by the intelligence of racing men, and as long as the latter want much for their money in bulk, besides an immediate descent from renowned sires and dams and all the young stock to be seen and estimated at a premature age on account of early entries and engagements; so long as these are the premiums, so long will they damage and lead to the premature worthlessness of many of the best young horse-stock of that particular and highly-esteemed class.

With regard to steeple-chasing, if it is to be continued under the patronage of gentlemen, there is one basis only on which a code of bye-laws should be formed, which should be to distinguish flat-racing from steeple-chasing essentially, and make them separate institutions, having for their primary object the improvement of the breeds of horses. I believe that steeple-chases should be competed for between half-bred, to the exclusion of thorough-bred, horses, and that all those which had started for a flat-race should be excluded from the nomination lists of half-bred horses. On the above plan I believe that steeple-



chases would do good, they would bring out, nay lead to the establishing of new classes of horses—both the pure and half-bred would in different ways be tried. I thoroughly agree in the correctness of the principle that Admiral Rous inculcates, showing that it is not necessary to place on a horse's back enormous weight and send him over an excessively long distance at a racing pace, to try his powers of endurance for ordinary purposes. I should be quite satisfied with ten stone weight, and the distance run not over three miles nor under two—for four-years-old colts, as a trial of their ability, to carry fifteen stone to hounds; and I should consider twelve stone weight and four miles distance, ample for the steeple-chase except where special provision was made for the accommodation of amateur riders of higher weight.

More good results may be expected from the silent action of horse-breeders themselves, after watching the current of discussions, than can possibly come from a multitude of counsellors alone; it may be by co-operation of both probably, that the most good may result; persuaded that to draw a more marked distinction between the pure blood and half-bred horse would be advantageous for both classes, I see nothing that would tend so soon to effect the object, as by giving the latter a fair chance to be distinguished in his special work, hunting and the steeple-chase.

At first it may be said that the half-bred horses cannot come up to modern notions of racing speed; then so much the more will it be advisable to open up encouragement to breeders, to bring them up to the required standard. If it were thought advisable not to prohibit thorough-bred horses from entries with half-bred, but to weight them, I would in such case have no great complication such as a handicap, but a stated penalty, such as would only admit of very good race-horses competing—on the understanding that the kind of race is made to try the hunter, and to encourage his breeder. No horse is fit for steeple-chasing before he is five years old; therefore weights for five, six, and aged, would be all the variation required. With regard to provision for entire horses, few of those, of the half-bred class could be found to race at the present time; but they should be encouraged, and in the course of two or three years, some would appear. I would suggest that, for steeple-chasing, entire horses should carry the same weight as mares and geldings, believing that the former has no advantage over the latter after five years old, but rather the reverse; and especially would it be the case with horses which had not had a long systematic training. Not to open the way to old tricks of exchanging half-bred for thorough-bred foals, &c., there should be as much want of inducement to run half-bred with pure-bred horses as the opposite. No horse with spurious pedigree should be allowed to start for any of the produce stakes.

With regard to the speed of the best horses of 150 years ago, and those of the present time, the more discussion is indulged in



on such relative matters, the warmer it usually becomes; and the farther generally, are ideas carried from the truth, and old traditions supported by hitherto accepted data, are departed from. If those who presume to determine to a second the time Flying Childers took to run a mile, were asked to give the speed respectively, and compare Whalebone, Priam, and the Flying Dutchman, I believe they would not be able to satisfy many of the best judges on such matters; and again, let the names of Vermouth, Blair-Athole, and General Peel, be placed at the head of three columns, which should be composed respectively of the names of the male ancestors of these three young horses as far back as the thirteenth line; and then let the question be put (with the object of eliciting opinion as to the relative speed) between the remotest stallion referred to and the three-year-old at the head of the column, and ask which of the horses of the past can be pointed out with certainty as *inferior* to the last, in the line of progeny? And how many of them, and which of the horses in the twelve generations possessed least merit?

The timing of fields of horses in a public race, I regard only as proximate evidence, affording no positive proof of their speed. There are many concurring circumstances which influence pace in a race; and then, assuming that two or more horses go at their fastest pace over a given course, and that others do the same the following year, there exists the disturbing element of the course never being two seasons alike, and that more physical force is required on one occasion, than on the other, hence the difference of time, though the test of the relative merits of the horses running together will not be disturbed by the difference shown in the speed of the two years.

I consider the breed and stamina of the English thorough-bred horse at the present time to be good. On that part, I see nothing to urge; nor yet on the management of mares, or foals up to twelvemonths old, when, allowing for many exceptions, I think the young rising stock could be developed to greater perfection, and horses preserved sound and useful to a much longer period than now is the case; and in this respect, I believe that the horses of the last century were in a better state than those of the present.

That which England is really in the possession of now, and which, all other requisites being available, I regard as of the first importance, is, the greatest number of thorough-bred mares, of the very highest quality, that was ever before to be found in this or any other country. Not only are the thorough-bred mares as necessarily superior in numbers to the horses of their kind reserved, but they are, on the whole, greatly superior as a class. Of this fact I have no doubt, and I think the causes are also discernible. Both sexes equal as foals, the colts are in a greater proportion trained than the fillies, and are kept more constantly and longer in training; and then, after that ordeal is over, whatever



be their age at the time, an artificial *regimen* is kept up, as little in accordance with Nature's requirement as was their previous state.

The mares, on the other hand, return early to the stud, where their natural freedom is again enjoyed, under which they grow and flourish; or if of adult age, they recover from the effects of work and artificial influences; so that within two years it is not apparent, with few exceptions, that they have ever done any hard work; good stallions are to be found, though they are few and far between, in comparison with the mares.

We have only one other class in England which can show a stock of good mares, viz., the heavy breed, for cart work, which, both in Scotland and England are to be found very fine; but in all the intermediate classes, from the Cleveland to the small Nag, between which and from which variety the hunter and roadster breeding mares are to be looked for, there has been a progressive diminution during the last five-and-twenty years. And I think this statement will be borne out by practical breeders over the country.

There are other complaints which call for redress, and which are less likely to meet with spontaneous adjustment than breeding; I allude to the rearing and preservation of the young stock, alike before and after their work begins.

Admiral Rous, has made some statements worthy of being read by every horse proprietor, to the effect that the carrying of heavy weight reduces the fastest animal to comparatively slow action, and he says that the law applies to men as well as horses; and that if we put a man of eleven stone to ride the fastest horse at Newmarket, in six months he would lose his racing form; and also that porters who carry heavy weights, and wear thick shoes, are slow movers compared to tailors, &c.

In respectively setting forth my own humble part of the labour, in which the experienced observer of the race-horse joins, I cannot better acknowledge my high estimation of such effectual co-operation, than by repeating the words uttered a few years since by one of Scotland's departed geniuses:—

“Science and art may be compared to a game at leap-frog, in which Science takes the first bound, and then stoops and bends her broad shoulders for Art to spring over, when Science in her turn again,” &c.—*The late Professor George Wilson.*

I beg now to state, that permanent loss of speed is not an inevitable consequence of carrying weight. The changes which are going on in the animal structures, and the causes which produce the abnormal state, are demonstrable phenomena. I believe that when King Herod, Eclipse, Highflyer, Shark, and many other horses of that time ran, they not only carried heavy weights over long distances in their races without sustaining injury, but that such light boys as have been early taught to ride now, were not then put on such horses for exercise; be that as it may, there were

other conditions in favour of the horses of that time, for the retention of their speed unchanged in any apparent degree during a long career on the turf.

When a horse gallops over a heath at speed, with eleven stone on his back, he is putting to the test every fibre of which his system is composed; and between the man above, and the outer surface of the sole of his foot below, there is commonly in existence an antagonism, amidst which the sources of motion are placed, as it were, between two fires—a down-pressing weight above and insinuating pain below; and therefore, though without the additional causes, the eleven stone would not permanently affect the horse, combined together it will operate twice as fast as five stone and a half would do. This state of matters is not peculiar to race-horses, although being submitted to more severe trials than other classes they give early indication of every morbid change. Otherwise, the same causes combined, which send the race-horse from the trainers' hands to the stud or the hammer, condemn the hunter to the cab, the cart, and the slaughter-house, and the powerful cart-horse, which in his natural state could draw a heavy load four miles an hour with ease, to do less than three in the same time, under painful exertion. During the twenty-five years I was in practice at Florence, being frequently called to Leghorn, I observed, besides the horses I was called to see, a little army of hired porters at work in that busy seaport, employed in transferring grain, and all other kinds of merchandise, from ships and barges in port to stores in the town, and, *vice versa*. These porters all went without shoes or stockings, long wooden planks and flat pavement formed their footing surface over the distance, from the barge in the canal, through streets, and into the warehouses, either on ground or first floors. These men I have seen moving up and down in succession, one after another in rows, carrying their sack of wheat with the ease and regularity of a footman carrying a tray. The nimble movements of the men were obvious, as was also the fine muscular form of their legs, and the perfect arched form of their feet; and yet that work was the calling of their lives, and the men varied greatly in their respective ages. In confirmation of what Admiral Rous states, which under different conditions he has seen, as well as myself, I will quote two passages from my own writings published within the last three years, first in "The Field," and reproduced in this Review, vol. iii. 1861, I said, writing on the art of shoeing, whoever rides a horse so treated will at once feel the difference in all his paces; it would be, however, in the faster in which the animal would soonest and chiefly suffer. London dray-horses, and the men who drive them, have alike been deprived from early age, through clumsy and ill-adapted shoes, of some of the chief functions of their feet,—hence prevention of a natural development of their limbs, and as the effect of impeded



functions, the man's legs look hardly big enough to bear his body, and the horse is deprived of much of his agility. Neither the one nor the other are necessarily lame, because the pace at which they move is not very trying. But let a horse, under the conditions represented, be put to fast work, and the effects will soon be apparent,—taking, for example, the race-horse in training, &c. Again, in the “*Edinburgh Veterinary Review*” for 1862, at pages 492-3, I have gone into details on the changes which the structures in the limbs of the horse undergo, and how his physical powers are diminished as deformity and disease in his feet advances.

I confess that I entertain a growing confidence now of seeing, ere long, men beginning to open their eyes, and to acknowledge the necessity of a more rational way of managing sound, and treating injured and diseased animals, and not only race-horses, but all classes of that delightful servant of man. Breeding is the first step of importance; but to breed horses, and neglect them, is like building a house and then destroying it.

---

*Cases of Strangles.* By JAMES MILLER, Veterinary Surgeon,  
Bradninch, Devon.

STRANGLES has been very prevalent in my neighbourhood this spring, and many of the cases unusually severe; I have selected the two following cases for insertion in your journal, should you deem them worthy of it.

About the middle of March of the present year, a farmer called my attention to a colt about twenty-two months old, which he had just broke in to do a little light work; he informed me the colt had a cough, and I observed it was very light in carcass, but it fed well, and did its work cheerfully. I ordered rest and a change of diet. Saw it again on the 1st of April, when I was attending another horse on the same farm. Cough still present. It had been at work for several days past, and so continued up to the 17th, when I was called in to attend it. It had now a severe attack of inflammation in the throat, great difficulty in breathing, which could be heard many yards distant; parotid glands swollen, the slightest pressure on the larynx caused acute pain; pulse about 60; appetite moderate, but unable to satisfy it on account of the difficulty it had in swallowing, every attempt to do so brought on a severe fit of coughing. I ordered hot fomentations to the throat; the head to be steamed several times a day, and any sort of food it would partake of. For sickness I generally allow the animal to choose its own food, believing instinct or appetite to be a safe guide to what is suitable and agreeable to the system in sickness. It would be useless to note the symptoms from day to day, and the means adopted to remove them. I simply endeavoured to relieve pain by fomentation, and give what support I could

to the system. Very slowly an abscess formed in the parotid region; opened it on the 18th,—about two ounces of matter escaped.

My patient appeared now doing well, all difficulty in swallowing gone, breathing quick, pulse 50. There was still that cut-up appearance in the flank I could not account for—not the appearance often seen in colts suffering from strangles, which are nearly starved from not being able to swallow food; the abdominal muscles were tucked up, and felt as rigid as in a case of tetanus; breathing was very slow, and appeared to be performed with pain. I ordered the colt to be turned out to grass, trusting, whatever was the cause, nature would remove it.

On the morning of the 27th May, I was called in haste to the same colt, which was considered to have inflammation in the bowels; found the colt rapidly sinking—it had improved in condition very little since I saw it last, but had fed well, and had done its share of work in the plough the two days previous to the 27th, without showing any symptoms of fatigue—there was no rolling as in inflammation in bowels. When standing strained violently, as if to expel its fæces; when down, lay quietly on its back. It died about one hour after I arrived; shortly afterwards I opened it: respiratory organs all healthy. On opening the abdomen a quantity of thinish matter escaped; on removing the intestines attached to them, and right under the kidneys, was a large abscess, the bursting of which had been the cause of death; the abscess weighed over ten pounds, and had contained several quarts of matter. All the other organs in the abdomen were healthy.

This abscess explained to me the cause of the tucked-up belly, and I am convinced it had been forming at least since the middle of March (the first time I saw the colt), and a month before any local symptoms of strangles were manifest; and I am also convinced that this abscess forming was the reason that the abscess in the parotid region formed so slowly, and discharged so little matter in proportion to its size.

The Second Case was a severe and protracted one in the region of the throat. Several abscesses formed: one of them took up its position on the masseter muscle, which interfered for some time with mastication; it pointed, and was opened right over the parotid duct,—there was a copious discharge of pus: about a week afterwards the orifice had closed before all the matter had escaped. I re-opened it, and, applying a little pressure to assist in emptying the abscess, I was surprised to see a limpid fluid escaped. Having doubts that I had done what I was so careful to avoid,—open the parotid duct,—fomentations were applied to the abscess. Four days afterwards the horse was brought to me; the person who brought him informed me there was a “great discharge of water from the abscess when feeding;” on giving him a small



quantity of hay, about an ounce by weight; all doubt of the duct being opened was removed. As soon as he began to move his jaw, there was, in a continuous stream, a copious flow of saliva. It discharged about three ounces during the two or three minutes he was grinding the ounce of hay. I felt rather annoyed at my carelessness, but having great confidence in *Nature* for rectifying my mistake, I trusted that in her own quiet way she would shortly close the breach I had made, and send the fluid on in its proper channel; my confidence was rewarded, for in about a week afterwards the orifice was healed over. At the same time I opened a large abscess over the parotid glands, and gave vent to two pints of matter, from this time the horse improved rapidly.

BRADNINCH, DEVON, July 1864.

---

### *The Great Horse Show at London.*

FRIDAY, 1st July 1864, will henceforward be marked in our calendars as the day on which the first great exhibition of horses only, worthy of comparison with similar displays in other departments, took place. Exhibitions of works of art, no less than of the products of nature, form one characteristic of the present age; and no one dissents from the general voice heard, that it is by such means that real social progress is brought about and maintained.

Shows of our domestic animals have, amongst others, gradually extended in number, scope, and the interest taken in them, and have constituted means whereby the finest specimens of all species of agricultural stock commonly to be found have been arrived at, and economy and increase have been the result.

Though horses have formed part of the stock exhibited at agricultural shows, besides some exhibitions of stallions being held locally, merely for canvassing purposes on the part of owners amongst the farmers of a district, no great or general exhibition of a large number of various classes has been held, nor have the best judges been brought to agree on what constitutes the best horse for a given purpose to anything like the same degree of exactness as has been arrived at by judges of sheep, cattle, pigs, &c.

It is to such an exhibition as the one we recently visited that we look with confidence for better common understanding on many questions, and therefore heartily wish success to this laudibly-conceived and excellently carried-out project. We left our northern capital fully persuaded that we were going to see an exhibition of horses worth travelling 400 miles to study over; but as we entered the great Agricultural Hall at Islington on Friday morning at nine o'clock, our surprise and admiration were almost

raised as high as when we first entered the Royal Crystal Palace in 1851.

We scarcely had time to look round the spacious building, with its admirably arranged lines of boxes for the stallions and stalls for other horses, when the judges entered the grand circus, and ordered the first-class—the thorough-bred stallions—to be led into the arena.

There were thirteen classes to be disposed of, some of them numerous, viz :—

42 Thoroughbred sires, best calculated to get horses for the Turf, the Chase, or the Park, . . .	L.250
23 Roadster sires, of any height or breed, . . .	50
26 Hackneys, over 15 hands, . . . . .	50
31 Hunters, of any age, equal to not less than 14 stone, . . . . .	70
23 Hunters, 5 years old and upwards, without re- striction as to weight carrying, . . . . .	60
13 Hunters, without any qualifications, . . . . .	60
38 Weight-carrying cobs, under 15 hands, . . . . .	50
9 Chargers, for light weights, . . . . .	35
8 Carriage horses, in match pairs, not under 15.3 hands, to be shown in harness, . . . . .	50
8 Arabs, Barbs, or other Oriental entire horses, . . . . .	20
16 Ponies, under 14 hands high, for saddle, . . . . .	30
18 Ponies, under 14 hands high, for harness, . . . . .	30
56 Ponies, without any qualification, . . . . .	30
311	L.785

The managers had been so fortunate as to obtain for judges of the different classes, the services of gentlemen of the highest standing amongst the hunting and turf celebrities of the land, and right earnestly they went about their work, which was kept up through the day, when it was found that four classes—consisting of weight-carrying cobs and ponies for saddle and harness—had to be put off till Saturday morning, when the work of judging was resumed, and the animals were individually and comparatively scrutinised.

The following is a list of the names of the judges :—

CLASSES 1 AND 3—THOROUGH-BRED AND HALF-BRED STALLIONS—The Earl of Portsmouth; John White, Esq.; William Williamson, Esq.; Colonel the Hon. Wellington Cotton; Captain Percy Williams.

CLASSES 2 AND 4—HUNTERS.—Colonel the Hon. Wellington Cotton; Captain Percy Williams; John Russell Cookes, Esq., Master Worcestershire fox-hounds; Frederic Winn Knight, Esq., M.P.

CLASSES 5, 5A., 6, 11, 12, and 13—HACKS, COBS, AND PONIES—F. W. Knight, Esq., M.P.; John Russell Cookes, Esq.; Capt. John Bastard.

CLASS 8—CHARGERS.—General Williams, late 1st Life Guards.

CLASS 9—CARRIAGE HORSES.—Captain John Bastard, Boodle Club.

CLASS 10—ARABS, BARBS, &c.—Captain Thomas Francis, Army and Navy Club.



The thorough-bred stallions formed the class on which most attention centered, and these were led in by three, four, and five at a time, when the process consisted of finally disposing of the least favoured, and reserving the best in each lot to return for more searching inspection. In this way the forty-two horses passed first muster, when the judges had determined that the winners of the three prizes in the first class and first section should be finally selected from seven horses which were brought back into the ring. When the Earl of Stamford's Citadel, by Stockwell, out of Sortie, five years old, was placed first; Nutbourne, by Nabob, out of Princess, the property of J. Wyatt, Esq., second; and Caractacus, by Kingston, out of Defenceless, the property of C. Snewing, Esq., obtained the third prize.

The rejected horses were walked out of the ring, to be brought back again presently with others; there being a sum of L.50 to be disposed of amongst such stallions of the class as were deemed fit to get hunters, and other horses for general purposes. Of this sum, L.20 was awarded to Neville, and L.10 each to the Czar, Newcastle, and Amsterdam.

Roadster stallions of any breed or height brought out some good compact horses, with action, from which President Junior, the property of Thomas Brown, Esq., was selected to receive the first prize; and Thomas Crisp, Esq., obtained the premium for his two-year old colt young England; while another two-year old grey colt received the third prize.

The show of hunters was the other class of the day which we regarded as the second of importance, and to this we shall refer again. These, in all consisting of sixty-seven horses, were divided into three classes, with conditions attached to the first as to age and weight-carrying capabilities.

The prizes given to the first lot of this class, viz., horses above five years old up to fourteen stone—were awarded—1st, L.50 to Beechwood, six years old, the property of J. B. Booth, Esq.; 2d, of L.20, was awarded to Overplus, six years old, the property of J. Musgrave, Esq.

The second class prizes were given to Rural Dean, six years old, belonging to S. Gale, Esq.—1st, L.30; 2d, of L.20, to Messrs R. and J. Russell's Battersea, seven years old; and 3d, prize of L.10, to Jim Crow, six years old, the property of M. Mumford, Esq.

To hunters in the third class, the prizes respectively of L.30, L.20, and L.10, were given to Captain J. S. Ballard's Oaklands, four years old; Mr H. Saunders' Brompton Boy, four years old; and Mr H. J. Sheldon's Harold, four years old.

Three good horses were especially noticeable in the class of light weight chargers—Carbine, a splendid and highly-broke brown gelding, the property of Lieutenant Hozier, 2d Life Guards, 1st prize, L.25; and another well-disciplined black gelding, the pro-

perty of the Hon. M. Wingfield, 1st Life Guards, Sir William Armstrong, Bart., gained the 2d prize, L.10.

A handsome, well-broke blood horse, by Knight of Avenel, ten years old, the property of the Right Hon. the Earl of Grosvenor, was also much admired, and rightly so, by the lookers on ; and we could gladly have seen him rewarded with some mark of approval.

Four pairs of carriage horses—the conditions for which class were that they should not be under 15 hands 3 inches high, and to be shown in harness—are the last to which we can devote special attention. Her Grace the Duchess of Beaufort took the L.30 with a well-matched handsome pair of blacks. These animals, excellent movers, are substantial and good wearing horses, such as will look splendid in the park, or to appear at a Court Drawing Room ; and, what is more, they are equally well adapted to take their noble mistress twenty miles into the country at a good pace without tiring. A pair of bay barouche horses, aged, the property of Mr J. East, jobmaster, received the second prize ; whilst a pair of four-years-old greys, belonging to the Messrs Wimbush and Co., jobmasters, went unrewarded. That the first prize was rightly adjudged, there was, we believe, no two opinions ; but we think that if the same mode of judging the carriage horses had been adopted as in the case of harness ponies, viz., of first trotting them stripped in the circus, and looking into the intrinsic merits of each, and then to have put them in harness, it would have been an improvement on the mode adopted—harness covers a multitude of faults. The young grey horses showed to disadvantage against their older competitors ; they wanted more time for preparation, and there was a little difference in their height ; but both were intrinsically good, sound coach horses of the best sort of the larger class.

The Arabs, with other Oriental entire horses, and the hacks and ponies, though as a whole interesting to those who saw them, need no special notice.

A few words on the awards of prizes to the thorough-bred stallions. As already noticed, men have not come to such definite understanding as to what constitutes a perfect horse as has been arrived at by the best judges of cattle, etc., hence they always differ about the first, and sometimes can hardly agree after two horses have run a race together as to which of them is the fastest. There is, according to our own view, too much verbal display in the announcement of this class ; we would suggest that the words “thorough-bred stallions” be allowed to stand alone, to designate the class, leaving out, “*best calculated to get horses for the turf, the chase, and the park,*” which nominal qualifications confound readers, and presupposing a degree of refinement in knowledge on the subject not possessed. The best thorough-bred stallion should imply the best of his class for propagating his species, whatever the purpose for which the stock is required ; an



ill-formed horse we should reject, whatever his individual performances, leaving him to win whatever repute such trial as he could gain might determine. The L.100 prize now awarded to Citadel marks that horse as the best amongst a large collection of blood horses, some of them untried stallions, but which have proved themselves stout and speedy race horses; whilst most of them are of unobjectionable descent. It is easier we own to criticise than to judge quickly amongst so many competing horses of varied, though real merits; yet duty compels us to ask—Was Citadel the best horse? We think not, and for the following reasons:—Firstly, because he is very defective himself; and secondly, because there were horses competing with him without such defects, which have given proof of merits such as Citadel never exhibited. Before going into details on the subject of our remarks, we would observe, that in estimating the real and comparative value of stallions, the first thing to be looked to is, that the horse should be faultless, as far as that object can be attained; if one be very perfect of 15 hands high, and another be nearer 17 hands and full of defects, we might wish our little horse was larger, but what there is of him being good, and whatever is expected of him in reason he will do, we look at our big and less proportionate horse comparatively, and ask, what can we do with him, or what can he do for us? Why, nothing well. Our perfect, deep-bodied horse of 15 hands—and as much between that and 15.3 as we can obtain—will not be out of place, put him to whatever class of mares he may be wanted for, be they good of their class—whether the wide hackney of 14.3, the blood mare of 15.2, or the large half-bred of 16 hands; the *old tramp* formed horse will suit them all. But what shall we do with our out-of-size horse of 16.2? Why, he will be out of place with every one of the class of mares mentioned; and if his owner change his mind and alter him into a gelding, he will not be worth much to ride, and little more for harness.

What, now, are the faults to be found in the prize stallion Citadel—the admired by all; and what are his recommendations? Well, the latter are considerable—he is a son of the justly reputed best stallion of this age, and the grandson of another of almost as high renown in the past; and he is, moreover, a great, glossy animal that “fills the eye.” But what has breed to do where the physical form of the animal is the question to be decided? the best of sires only get a proportion of their stock of such select quality and merits as to be considered worthy of being retained as stallions. And Citadel looks as if he was cut out for a grand horse—something on the scale of his sire—but has been spoiled in the making!

In the first place, Citadel, whilst a very high horse, measures in the circumference of his chest about eight inches less than his sire Stockwell, did at his age; and, without going into the lesser

details, that one falling off alone would throw the whole machine out of order. Along with these defects, however, may be mentioned a badly-placed shoulder, with elbows turned in, and the fore feet with no adequate form, capacity, substance, or planta surface to support the burden required to be borne. We should prefer the little D. O. or the well-bred compact Loup-Garou to such a horse as has been set forth as an example of the best out of forty-two in a class amongst which he formed one. The horse that we should have placed first was Neville—a stallion of the average height of the majority of good blood horses, about 15.3; and he measured considerably more in girth than his great competitor Citadel, though the former is fully three inches less in height than the latter; Neville is, moreover, a thoroughly symmetrically formed horse, with splendid action in conformity with his construction. Such an animal as this, if made to gallop through dirt across country, up and down hill, or over the level in a race, must in any case under weight, lose—such an animal as the one placed first. We should have placed Caractacus second; and perhaps Nutbourne would have been in his place as third, though he is heavy in appearance, and so are his movements in the walk and trot dependent on his form of forehand.

If we were driven to select from amongst the blood stallions over 16 hands and an inch high, we should have looked again at Horror, taking his straight forelegs (the effect of usage) into the bargain. As a large horse he has the strongest formed body, the best back and loins, and the most capacity of chest of any of the over high horses exhibited, and his legs bear a relation to his body which gives command under weight. King of Diamonds would have been a great improvement among the second class over the slack-backed, narrow-waisted Newcastle, his showy two ends notwithstanding.

The *Czar* was, we consider rightly judged as “valuable for getting hunters, hacks, or troopers.” That horse looks as if some of the substance of the old Irish hunter is combined in him, with an ample amount of the pure breed for a stallion for the purposes announced.

The first-class hunters we notice again for two reasons—firstly, because we believe that the second prize horse Overplus was by far the best in the ring; but admitting that he was only second amongst such a number of good horses, and also admitting, what no one denies, that he is an uncommonly well-formed clever young hunter, we would make use of that fact to illustrate a principle. Overplus is the son of Augar—a stallion which stands little over 15 hands 1 inch high—and yet Overplus is by no means the only specimen of good formed hunters which can be shown amongst the produce of that handsome, though crippled, grandson of Sir Hercules; and when will the out-of-form 16 hands and half,



Citadel, produce such a level beautiful specimen of the English hunter? We fear never, if it be true that like begets like.

Our motto is, give us good breeding, symmetrical form, and with these, action, and save us from estimating the power, worth, and beauty of horses by their great height. Truly we have some large good horses, and these constitute the great wonders; as we have also had our little wonders, both of which come occasionally by chance if the right medium is aimed at and preserved in the stock. We look with confidence to the influence of future exhibitions on the scale and with all the good management of the recent one for the best results. It will be a means of improving the judgment in horses, of every one who avails of such opportunity.

And now that the proprietors and managers of the Agricultural Hall at London, have proved, to the satisfaction of all, that the best possible accommodation can be afforded for a much larger number of stallions than were sent to the first of their exhibitions, we may expect to see that many of the most valuable thoroughbred horses which would not otherwise be risked, will be sent there; and we hope also to see two other classes well represented in future, viz., that of the coaching, and of cart stallions, in the latter the Midland Counties and Clydesdale horses might compete side by side with mutual advantage to breeders on both sides of the Tweed.

# EDINBURGH VETERINARY REVIEW

AND

## Annals of Comparative Pathology.

---

### THE CATTLE DISEASES PREVENTION BILL.

THE report of the Select Committee, and the evidence taken before that Committee, have not yet reached us, but the result of the recent inquiry has evidently been to convince Government and independent members of the necessity for some legislative interference, with a view to check the spread of contagious disease. Notwithstanding the opinion formed, as here stated, the Government withdrew the Cattle Diseases Prevention Bill when it came before a Committee of the whole House, owing to the determined opposition of the Irish members, who had so recently before threatened to overthrow the Ministry. Mr Hunt wished the Government to persist with the measure, but the Right Hon. the Vice-President of the Privy Council thought discretion the better part of valour, and did not wish to subject his party to the annoyance of division after division, which could only suit the temper and convenience of the earlier days of a Parliamentary session. The Bill is only withdrawn for a time. Government has now information, and is backed by influence calculated to overcome the opposition of the enormous class of interested parties, who secured that the time of the Select Committee should be taken up as much as possible by those who were adverse to any interference with the traffic in diseased stock. Those who are most in favour of legislation on the subject do not express regret at the withdrawal of the Bill. They consider that so important an Act should be maturely considered and well understood by all whose interest it affects, and it is very desirable that the general public should be made alive to its importance. In London, the medical papers, and the efforts of Dr Letheby and other medical officers of health, will secure this. In Edinburgh much has been done; and the Town Council has not only determined to deal with the question practically at home, but has resolved on appealing to Government, through the Lord Advocate, for further powers. Two



additional inspectors are to be appointed—one at a salary of two hundred a year, and the other at one hundred and fifty. We trust they may both be drilled veterinarians, and that the work accomplished by these inspectors in Scotland, may lead to similar appointments throughout the United Kingdom.

We have to appeal to the veterinary profession for any statistical information gleaned in daily practice; the most important facts are those referring to the losses incurred on individual farms through the purchase of stock infected with contagious diseases, such as the epizootic aphtha and pleuropneumonia.

---

## ROYAL COLLEGE OF VETERINARY SURGEONS.

---

### QUARTERLY MEETING OF COUNCIL.

At a Quarterly Meeting of the Council, held the 6th day of July 1864—

PRESENT:—The President, Professor Simonds, Messrs Braby, Brown, Dickens, Ellis, Greaves, Harpley, Harrison, Helmore, Lawson, Moon, Wilkinson, Withers, and the Secretary.—The President in the Chair.

The minutes of the preceding meeting were read and confirmed.

Communications were read from the several gentlemen who had accepted the office of Vice-Presidents, to which they had been elected at a former meeting of the Council.

The Secretary reported, that at the meeting of the Court of Examiners, held 21st April, a discussion took place relative to the time of the meeting of the Court of Examiners in London, when it was suggested by the chairman, Professor Brande, that the future examinations should take place after the first annual meeting in May, as the time appointed had proved extremely inconvenient to some of the members; in which the professors of the Royal Veterinary College concurred.

At the several meetings of the Court of Examiners, held in London, 21st, 22d, and 25th April, 37 pupils were admitted members of the body corporate, and two rejected. At the Examiners' meetings in Scotland, held 27th, 28th, and 29th April, 34 pupils were also admitted members, and three rejected. Three pupils were re-examined before the whole Board. Mr Robert Burnett, who paid his examination fee, did not appear. On referring to the certificates, it was found that James Taylor's

examination was irregular; his certificate bears date 25th April, and his examination took place on the 29th, four days' notice having only been given instead of seven, which is an infringement on Bye-law 27.

It was moved by Mr Wilkinson, and seconded by Mr Lawson—"That the Report be entered on the minutes, and that the Secretary of the Scotch Board be requested to give such explanation as is within his power in reference to the irregularity which took place in the case of Mr James Taylor's examination."—Carried.

The Registrar has to report the deaths of Mr Phillip Hempson, May Fair, London, who obtained his diploma May 24, 1855; also of Mr William Mavor, London, who was a member of the Council—his diploma bears date July 28, 1829; and Mr Richard Strickland, Newport, Isle of Wight—his diploma is dated June 29, 1816. Eighteen copies of the Register have been sold during the past quarter, and ten distributed gratuitously. The attention of the Council was called to the increased number of members admitted to the body corporate, viz., 161, since the last issue from the Registration Committee, when it was suggested that an addendum be printed to the present Register.

It was moved by Professor Simonds, and seconded by Mr Ellis—"That an addendum be printed, and carried out on the same principle as the present Register."—Carried.

The Report from the Finance Committee, and the Quarterly Balance-sheet of the Treasurer's Account, was submitted. The current expenses for the quarter amounted to L.76, 13s. 11d., which they recommend should be discharged. They also recommend that the sum of L.10 be advanced to the Secretary for petty cash to meet incidental expenses.

The Report was received and adopted. Cheques were ordered to be drawn for the current expenses.

The re-appointment of committees for the year was then proceeded with, viz.:—

The Finance Committee to consist of Messrs Braby, Ellis, Harpley, Moon, Simonds, and Wilkinson.

The House Committee to consist of Messrs Harrison, Mavor Spooner, and Withers.

The Parliamentary Committee to consist of Messrs Ernes, Goodwin, Harpley, Harrison, Mavor, Moon, Secker, and Varnell.

A question having been raised as to what had been done by the Select Committee in the House of Commons in reference to the "Cattle Diseases Prevention Bill"—

Professor Simonds replied that the Committee had amended the Bill—that contagious diseases were provided for by the infliction of a penalty. As to veterinary surgeons being appointed cattle inspectors, he had urged the necessity, but found that any person in authority in the local districts could appoint them.



The President announced to the meeting that the profession had sustained a great loss in the death of the late Professor Miller, who had so ably filled the chair to the Scotch sections of the Board of Examiners.

The Council resolved—"That a letter of condolence be forwarded to the widow."

A letter was then read from Dr Struthers, stating that he had tendered his resignation as secretary to the Scottish section of the Board of Examiners, expressing his opinion that the office should be a remunerative one.

After some discussion on what would be considered by Dr Struthers as a sufficient remuneration for his services, and also whether he could efficiently perform those duties now that he was resident in Aberdeen—

Mr Lawson, one of the Board of Examiners, said he would undertake to ascertain from that gentleman the necessary information.

The election of a chairman and secretary to the Scotch Board of Examiners was deferred for future consideration.

The business of the Quarterly Meeting having terminated—

A SPECIAL MEETING was then convened, the same members being present, to consider the alteration of Bye-law 21, which was to the following effect, viz.:—

"Each section of the Court of Examiners shall have a chairman and a secretary.

"The chairman of each division of the Court shall be elected by and from amongst its members.

"The secretaries shall be appointed by the Council."

After having been proposed by Mr Wilkinson, and seconded by Mr Ellis, was carried.

The original Bye-law was to the following effect—

"Each Court of Examiners shall select a chairman and a secretary from amongst their body."

---

#### SPECIAL MEETING OF COUNCIL.

At a Special Meeting of the Council, held July 13, 1864, for the purpose of confirming the alteration of Bye-law 21—

PRESENT:—Messrs Braby, Brown, Harpley, Harrison, Thacker, Wilkinson, and the Secretary.

The President being absent, it was moved by Mr Wilkinson, and seconded by Mr Braby—"That Mr Harpley, vice-president, take the chair."

The minutes of the Quarterly and Special Meetings at which the said Bye-law was adopted, were read and confirmed.

The new Bye-law having been read and submitted, it was moved by Mr Braby, and seconded by Mr Brown—"That the alteration of Bye-law No. 21, made at a Special Meeting of the Council, held July 6, 1864, be now duly confirmed."—Carried.

It was then moved by Mr Harrison, and seconded by Mr Thacker—"That the amended Bye-law, No. 21, be duly signed and sealed, in accordance with the provisions of the Charter."—Carried.

By order of the Council,

WM. HENRY COATES, *Secretary*.

## PERISCOPE.

### COMPARATIVE VALUE OF THE DIFFERENT GRASSES.

By ARCHIBALD STURROCK, Kilmarnock.

(From the *Journal of Agriculture*, July 1864.)

IN these days of low prices for corn, and good prices for beef, wool, cheese, and butter—when many farmers consequently feel inclined to graze more and plough less—it appears to the writer that the subsequent descriptions and remarks on grasses, and on a few other herbage plants, along with several tables of mixtures of the seeds suitable for different soils and purposes, may be somewhat *apropos* to the times, and favourably received by cultivators. The intelligent farmer should not only know *how* to grow grass, but it is quite as requisite that he should know *what kinds* to grow so as to have good grass, and thereby obtain the best possible return for his labour and expenditure. Of late there have been discussions by our agricultural clubs all over the country on "the best means for improving pastures;" and, certainly, so far as rotation-grass is concerned, the first step to have *good pasture*, after the land has been thoroughly cleaned and manured, is a proper selection of *fresh clean seeds*, of the best species fitted for the special purpose and variety of soil, to sow down with. There is not much use in laying out money upon bones or other grass-manures to top-dress a lot of worthless grasses and weeds, as the herbage of only too many of our pasture-fields now consists of. Many farmers feel satisfied if they see their pasture-fields pretty rough on the surface, without considering that this roughness may be, and often is, owing to the greater portion of the herbage consisting of such unpalatable and innutritious species of plants that cattle will hardly eat them till nearly at starvation-point. If these species were absent, and their places occupied by better sorts, the pasture would be much more closely and evenly cropped.

In the west and south-west of Scotland, where the dairy system of husbandry is carried on so extensively, and where abundant pasture of the most nutritious quality is so essentially necessary, the importance of having a knowledge of the best species of herbage plants becomes great. Bearing in mind that over the greater part of the district mentioned, as well as in other districts, it is the grass-lands which pay the most of the rent and are the chief source of profit to the farmer, their comparative superiority ought to be a matter of the very first importance; and selecting the seeds of the best species for sowing down the land to grass deserves more skill and attention than what is really paid to it.

The large and important natural order of plants, named in the Jussieuan system *Gramineæ*, or *The Grasses*, comprehends in all about 300 families or genera, and these are composed of nearly 4000 distinct members or species, forming about the twentieth part of the whole known vegetable kingdom. It



ranks as the most valuable order of plants cultivable for economical purposes, especially as in yielding food in many different forms, either for man or beast; comprising, as it does, all the *corn*-producing plants (wheat, barley, oats, rice, &c.)—the great proportion of those which constitute *pasture* or are cultivated for *hay*—the best of the *sugar*-yielding species—with many others which abound in useful and fragrant juices, odours, &c.

The *grasses* of all plants are the most extensive in geographical range, being found in every part of the world. They form the highest zone of phanerogamous vegetation around the snow-clad summits of the loftiest mountains; and they are the last form of flowering plants to be met with—associated with the lichens and mosses—as we proceed in a horizontal direction towards either pole of the earth.

The native British *grasses*—taking that word in its popular and restricted sense as meaning the greater proportion of those plants which form the common and verdant covering of our pasture-lands and meadows—extend to, in all, 133 distinct species, and 72 permanent varieties of these; but only 94 of these species, along with varieties, grow indigenously in Scotland. The whole of these species are distinguished from one another, not only by obvious botanical characters, but also in their nutritive and economical values—hardiness, duration, habits and seasons of growth, and fondness for, or a dislike of, particular soils and localities.

The stem or “culm” is herbaceous, hollow but closed at the joints, bearing leaves with a split sheath through which the stem passes, and of only one season in duration; its height ranges from a few inches, as in sheep’s fescue, up to 3, 4, and 6 feet, as in the Reed canary-grass and others. The *spikelets* or flowers are arranged in what are called *spikes*, *panicles*, and *racemes*; these spikelets consist of the *calyx*, and of either one, two, or many *florets*. The *calyx*, placed at the base of the spikelet, is composed usually of two *glumes*—rarely of one only, or entirely wanting. The *florets* have two *paleæ* or *pales*—the outer one the largest, which is often furnished from the summit, back, or base, with an awn of various length. The *pales* are so called from their encompassing the sexual parts, which, with but very few exceptions, consist of three *stamens* and two *styles* present in each *floret*, and consequently belonging to the class and order *Triandria digynia* of Linnæus. The composition of the *seeds* is chiefly *farinaceous*. All the species produce *radical* or *root leaves* in more or less quantity.

The great majority of the *grasses*, particularly such as form good pasture, have strong social or gregarious habits, and are liable to pine and die out except when they grow in considerable admixture. The different species—it may be of the same botanical family, of the same natural habitat, and of much the same nutritive value—have very different seasons of leafing and of arriving at their maximum vigour of growth. It is to this property that the great superiority of old natural pasture, which is always composed of a considerable number of species, over artificial pastures—that is, pasture sown down with one or two species only—is chiefly owing.

The *grasses* which constitute the principal spring and summer herbage of the best natural pastures of Britain are the following:—meadow foxtail, meadow fescue, cocksfoot, ryegrass, oat-like soft-grass, sweet-scented vernal, and the annual and smooth-stalked meadow-grasses. Those which constitute the principal summer and autumn herbage of these pastures are:—rough-stalked meadow-grass, timothy, the hardish fescues, crested dogstail, yellow oat-grass, and woolly soft-grass. And those which grow most vigorously during the autumn months and well on into winter are, some species of wheat-grass and of the bent family. Of course, a portion of the herbage during the several periods of the year is composed of the perennial red, white, and yellow clovers, with a sprinkling of wild vetches, and during the autumn months, the milfoil or yarrow. Several other plants also—such as ribgrass or plantain, sorrel-dock,



yellow buttercup or crowfoot, and the common daisy, &c.—always form a portion of the herbage in even the cleanest enclosures ; but, not being nourishing ingredients, they can only be looked upon in a sense as pests and weeds, and are only eaten to any extent under a pressure of hunger through the exhaustion of the more nutritious grasses. The crowfoots (*Ranunculi*), in particular, are very prevalent in some pastures, completely overrunning the surface of the fields ; and farmers cannot be too careful in seeing that the seeds of these are thoroughly cleaned out from amongst their grass seeds before sowing. A small proportion of some of these plants, however—such as crowfoot, yarrow, and sorrel—although in themselves too bitter to be eaten unmixed, may be useful to cattle when taken as condiments and astringents along with the nutritious but tasteless grasses—even as sheep are seen to eat and relish parsley and yarrow when sown in mixture with grass seeds upon a sheep-walk.

Every species of grass has its own peculiar habitat or natural place of growth. Some few, with strong creeping roots, grow and flourish upon the most barren soils, even on the loose sand-hillocks by the sea-shore ; and they are very useful in forming a sward upon these, thereby preventing the drifting of the sand over the more inland arable lands. Some others, particularly the small and fine-leaved sorts, grow naturally and thrive upon elevated lands and hills, frequently as high as some 3000 feet or more above sea-level. These hardy grasses cover our hilly tracts of lands with their fine and nutritive herbage, affording a bite, during the most rigorous of our Scottish winters, to the many thousands of sheep and deer which have “the range of the mountains for their pasture.” Other grasses, again, unlike the preceding hardy and fine-leaved species, do not succeed when grown upon lofty and exposed situations, but come to perfection only in places where they are much sheltered, as in lanes and under the shade of trees. A few species are of very aquatic habits, and only flourish where they can luxuriate in a copious supply of their necessary element ; the herbage of some of these is very sweet, and nourishing in a high degree. Our “moors and mosses many,” likewise, have their own peculiar inhabitants, and these are generally of a harsh texture, with little foliage, and of the most innutritious nature.

Finally, on our low-lying, deep, rich pasture-lands and meadows, we find growing most of those superior species which have been already enumerated, as affording the principal herbage of the best natural pastures of Britain.

Thus we see how liberally Nature has provided grasses—and, of course, other plants as well—possessing such differences of habit and predilection as to make them suitable for covering, adorning, and rendering fruitful every variety and quality of soil.

#### RYEGRASS

(*Lolium perenne*, of the tribe *Hordeaceæ*).

Inflorescence spiked ; spikelets arranged singly on each side of the rachis ; calyx of one glume shorter than the spikelet, the terminal spikelet excepted, which has two glumes ; florets not awned ; root fibrous.

*Natural grass* simply means *natural pasturage*. But this term has come to be applied to all the other grasses in contradistinction to the ryegrass alone, on account of the latter having been so long solely used for sowing in arable land, and hence usually spoken of as one of the *artificial sown grasses* ; yet the ryegrass is as much a *natural* or native plant of Britain as any one of the other 133 species. It has been in cultivation for fully a hundred years, and that, too, almost exclusively, although there are many other native grass plants by much more bulky, more nutritious, every way more profitable, and every whit as well adapted for the alternate system of husbandry,—almost the only merit to which the ryegrass can lay claim being, the profuseness and regularity with which the plant produces and ripens its seeds, but which merit is shared to at least nearly equal extent by some other species much superior to it, such as



cocksfoot-grass, rough-stalked meadow-grass, the tall and meadow fescue grasses, dogstail, &c.; and it is very questionable if such a property can be called a superiority in any plant used solely for herbage purposes.

The truest perennial ryegrasses, or those varieties whose roots are of the most permanent duration, are distinguished by yielding a greater abundance of root-leaves with fewer culms or stalks than those of shorter duration, known popularly as annual sorts, which produce a less quantity of root-leaves, and a greater proportion of stalks and seeds. The short-lived varieties, however, known as annual, are seldom less than of biennial growth, whilst the most permanent of the perennial varieties are liable to be degraded, by frequent seeding or other unfavourable circumstances, to a duration scarcely longer than of some real annual plants; and several varieties which have been introduced by experimental cultivators at different times, as yielding superior herbage, and of more permanent duration, have been so changed in both characters and habits, through the influence of continual culture, mixture of seed, &c., as to have lost almost all traces of the favourable properties by which they were originally distinguished.

The less permanent, or the so-called annual sorts, are commonly supposed to yield a larger bulk of grass in the first year, on account of the greater number and length of their stalks, and are therefore considered by many farmers as being the best kinds to sow for single crops of hay; but the larger quantity of root-leaves and stem-foliage which the more permanent sorts produce, fully compensates for any deficiency arising from the less weight of the culms, and the hay is also less wiry and more palatable.

No exact means exist of distinguishing the annual or biennial varieties from those of longer duration by their seeds alone. The correct course, therefore, for farmers to pursue, when desirous of having ryegrass of more than biennial growth, is to sow only such seed as has been saved from strong close-set healthy plants, of *at least* two years' standing—that is, plants whose roots are two and a half years old from time of sowing; and, when purposing to preserve the seeds of a few acres as above, the first year's grass should either be cut down when very green, or grazed off with stock.

At present, ryegrass seed is quoted and sold, according to the different weights per bushel, under some such mode as follows:—Seed weighing from 20 to 24 lb. as annual and inferior perennial; 24 to 26 lb. as good perennial; and all weights upwards of 26 lb. as fine and extra fine perennial; the merchants and others appearing to look upon these ryegrass seeds as if they were *grain*, intended to be ground into flour (pricing the seeds the higher, the greater the weight of flour contained in them), and not as if the seeds were intended for their true and only use, meantime at least, viz., for sowing to produce *good, permanent* herbage plants.

The present nomenclature, then, of ryegrass seeds in the merchant's seed-lists is wrong. Different kinds of soils, no doubt, have some effect in producing heavier or lighter seeds; sandy loams tending to raise larger and usually leaner seeds, and clays the reverse; but, as a general rule, the seeds weighing from 20 to 24 or 25 lb. may be taken as the most perennial, whilst those from 25 to 30 lb. are the sub-perennial, biennial, or annual. The error of misnaming the lighter and heavier seeds respectively, probably has arisen from the merchants purchasing the seeds as if they were cereal grain, and intended for a like purpose, with little or no reference to the after-grass of the fields from off which the seeds were saved; the heaviest seeds thus being the highest priced, and the perennial ryegrass bearing a higher character in the market than those varieties of shorter or annual duration, it was natural for the merchants, when again offering their seeds for sale, to quote those which cost them the most money by the name of that variety which stood highest in the estimation of most farmers.

Very small ryegrass seeds, weighing from 32 to 34, and even 36 lb. per bushel—being simply the cleaned *siftings* from out the great body of the rye-



grass—are quoted and sold under the title of *super* or *extra fine perennial*. They are certainly *extra fine* if the *size* of the seeds be only taken into account, but with regard to the plants raised from them it is quite the reverse,—these very small seeds being in great part the produce of a starved, stunted variety, named by botanists *L. perenne tenue*, and a most wretched *attenuated*-looking thing it is—a short starved stem, ditto spike and spikelets, with little or no foliage, and still less root-leaves.

Farmers might often save money by purchasing their ryegrass seeds about 22 lb. per bushel quality, or even less, and they would have better grass plants from such than from fine short heavy seed at a much higher figure; bearing always in mind, whatever may be the weight of the seed, that it be fresh and thoroughly cleaned. Even more, putting aside altogether the inferior sort of plants produced, the greater number of individual seeds in the bushel of the short heavy quality does not compensate in sowing more land for the difference in price. To sow the finest and heaviest seeds of the cereals is right enough, but recollect that the cereals are cultivated chiefly for their seeds, their straw being a very subordinate matter.

Some twenty years ago, the average weight per bushel of ryegrass seed in the west of Scotland was fully 6 lb. less than what it is now, and this fact is a sure proof of the deterioration of the ryegrass plant in permanency of growth. It would be well if our agricultural societies would consider that the ryegrass plant does not require any fostering care, it being already by much too exclusively cultivated; and that, by encouraging the rearing and bringing up of its seeds to nearly, if not altogether, as heavy a weight as oats, the usefulness of the mother plant as an herbage and forage grass has been considerably deteriorated. Prizes are offered for the best *perennial*, but they are universally adjudged (allowing other conditions—as freshness, colour, and freeness from extraneous seeds—to be equal)—to the *finest* and *heaviest quality* of seeds, which *are not* the best *perennial*, but, on the contrary, *are such* as raise plants the nearest approaching to an *annual* duration. Let the societies give prizes to the grower of the best 4 bushels of cocksfoot, or of meadow fescue, or of rough-stalked meadow-grass, or the best 1 cwt. of timothy, or suchlike, and a good, useful, practical end will be served; but the prizes at present given for ryegrass seeds, in the writer's opinion, at least, would do more good by being entirely withdrawn.

Although still going under the name of perennial, the ryegrass ought truly now to be called sub-perennial, or even biennial, for in reality the great proportion of it at the present time is nothing more. It may, very likely, long continue to occupy the vantage-ground which it now holds as an herbage and forage plant, custom being all powerful with many farmers; however, it cannot be gainsaid that we possess, in several species of the grasses, plants which rank much superior to it, either for hay or pasturage; and, if some of our more intelligent farmers would devote a little more of their spare energy to the introduction of these superior sorts by cultivating a few of the best kinds, and preserving the seeds themselves, so as *their seeds might be had of fresher quality, and at a lower figure*, we might, and would, soon see a change for the better in the appearance of most of our grass fields.

In the present state of the trade in natural grass seeds, it is next to impossible for a farmer to procure these of clean, new, and fresh quality, through dealers. The average price of the eight natural grasses—the best adapted for general purposes—is about 9d. per lb., whilst that of the ryegrass may be put down at 2d. per lb.; and this itself is one very particular reason why the ryegrass is so exclusively cultivated. Though it ought to be borne in mind that, owing to the size and weight of the individual seeds, a pound of cocksfoot, *poa trivialis*, timothy, dogstail, &c., comprises a vastly greater number of seeds than a pound of ryegrass, which lowers their prices considerably in comparison, as a much less weight of the kinds noted, and others, than of the ryegrass, is necessary to sow out an acre of land. The seeds of a few species, doubtless, will never be



had at a very low price, from the irregularity with which they ripen; but others, and these, too, being those usually recommended for agricultural purposes, might be had, to say no more, at a greatly less figure than what they are at present.

#### VARIETIES OF THE RYEGRASS.

There have been introduced, at various times, by experimental cultivators, several so-called varieties of the ryegrass—such as Pacey's, Whitworth's, Stickney's, Russell's, Pollexfen's, Devonshire, &c.—which originally, perhaps, were distinguished by some superiority in abundance of foliage, manner and time of growth, hardiness and duration, or other properties; but all of such varieties are much liable to sport, and become changed in growth and habits, as previously explained. Whenever the extra attention required in selecting and keeping the variety pure is given up, or even partly abated, and the variety left to make its own way, and take its chance of adverse soils and culture, mixture of seeds, &c., it very soon deteriorates, and falls back to a common mediocrity. Considerable quantities of ryegrass seeds are still sent out under the title of Pacey's perennial. The original Pacey's ryegrass was noted for its abundance of long and broad root-leaves, sending up comparatively few culms topped by rather short spikes—in fact, just a real *true perennial* ryegrass; but the seeds now usually sent out under this name are simply selected parcels of fine regular-sized and generally *heavy-weighted* seed, growing plants the very reverse of the original Pacey's—a great abundance of bare stalks with large spikes, and few or no root-leaves at all. As for their Stickney's, Whitworth's, and others, the writer has tried many samples procured from different quarters, and never could discover in the produce any superior properties or material difference worth notice when compared with the common ryegrass in cultivation. These *variety names* are the means, sometimes, of putting a few shillings extra into the merchant's pocket, and that, now, at least, appears to the writer to be the chief property possessed by any of them; and a useful property it is *to the merchant*. The principal points to be aimed at in good ryegrass plants are, undoubtedly, the greatest abundance of large root-leaves, and as few culms as possible, well furnished with broad foliage; and the best and only way to get into a stock of these is, by sowing seed preserved from vigorous two or three-year-old-rooted plants, taking the seed off the plant when it is fully filled, and just begun to ripen, and not allowing it to stand till dead ripe or overly matured.

#### RYEGRASS SEED-SAVING AS A CROP IN THE ROTATION.

The system of preserving the seed of the ryegrass as a regularly-recurrent crop in the rotation is carried on very extensively in the west and south-west of Scotland, and within these few years back it has been extending into other districts, especially in the north-east of Ireland.

The great majority of the seed-raisers are engaged in the dairy husbandry, and one would naturally think that the comparative superiority of their pastures should have the first claim on their attention; but, owing to this seed-saving system which they carry on, they are prevented from sowing the seeds of the clovers in such proportion to the grass-seed as ought to be the case, and on this account, for one cause, the produce and nutritious quality of their pasture-grass is very inferior, besides the thrashed hay being nothing but a mass of hard, wiry, unpalatable stalks. The average quantity of clover sown by seed-raisers does not exceed 3 lb. per acre, or even rather less, and along with this is sown about two bushels of heavy ryegrass; whereas, in the east country and elsewhere, the average proportion of clover, either for hay and grazing, or two or three years' grazing alone, amounts to at least from 12 to 14 lb. per acre.

It would be well if the seed-raisers would consider whether the sum of ready money which they get in hand for their grass-seed—high-priced even as that



seed is when compared with their wheat or oats—does at all nearly compensate them for the ultimate loss caused by the deterioration of the soil, the low price of their thrashed ryegrass hay, as well as the deficient weight per acre, and particularly the decreased productive powers of the two or more years' wretched grass which is obtained after the first year's hay-crop being allowed to stand uncut and fully ripen out the seeds.

If farmers will give a preference to the ryegrass over other superior species, and determine on its exclusive cultivation, by all means let even it, inferior though it be, have at least a fair chance; but a fair chance to produce good pasture it certainly does not get, when, by taking from the plants in the earliest stage of their growth a heavy crop of seed, the young roots are so much weakened that, in a very short time thereafter, the great majority of them die out entirely, their places being soon filled up by crowfoots and other weeds. The seed-raiser, by cultivating the ryegrass for its seeds, and doing everything in his power to procure a bulky crop of heavy seed off the plants, is gradually degrading it from a useful perennial into a very inferior annual, growing much less herbage and foliage with more stems and heavier seeds. Frequent heavy seeding of any grass tends to produce that effect; they in course of time become so much weakened that they die from the exhaustion.

In the county of Ayr alone, with which the writer is more intimately connected, there is annually preserved some 300,000 bushels of ryegrass-seed, which is exported to all parts of the kingdom, as well as to the Continent.

The exorbitant prices given for ryegrass-seeds these few years back is a great inducement to continue its culture. No wonder that the raising of ryegrass-seeds is made a regular trade of, when some 210 lb. of these fetch 30s., and only 17s. 6d. can be got for equal weight of oats, or 21s. for equal weight of wheat; seeing, at the same time, to the writer's own knowledge, that there are now many lands in Ayrshire, off the acre of which the farmer has as great a weight of ryegrass-seeds as what he has of the long oats, common in that county. Oats and the other cereals are only monstrous species of grasses. A bushel of 28-lb. ryegrass may turn out as much flour, possibly as nutritious, as what a bushel of 28 or 30 lb. long oats will; but we find the ryegrass-seed fetches 1s. 3d. per bushel extra money.

The heavy-weight qualities of ryegrass-seeds are the worst for growing good pasture plants.

#### ITALIAN RYEGRASS

(*Lolium perenne*, var. *italicum*).

Florets furnished with slender awns; glume considerably shorter than the spikelet; root fibrous.

The Italian, at its first introduction into this country nearly thirty years ago, was generally regarded as a distinct species, but is now placed by the best botanists as only a wide variety of the common ryegrass. It is characterised in having taller culms, and of a more tillering habit, several springing from the same root; has more abundant foliage, broader, and usually of a lighter-green colour; longer spikes, with more thinly-set spikelets; the spikelets also longer, containing more seeds, from most of which being awned, they are lighter per bushel than those of common ryegrass. It arrives much sooner at maturity than the common ryegrass, is greatly preferred by cattle, and greedily eaten by them, whether in a green state or when made into hay. It has been generally considered at most a biennial plant; yet, if cut down when green, or before coming into flower, it is found to continue for several years in duration.

The plants of the Italian ryegrass, like those of the common species, differ sometimes very much from one another. A kind known as short-awned Italian (*L. perenne*, var. *submuticum*) has thicker stems of a rather more spreading habit, and which, along with the foliage, are of a darker colour; and the seeds



have a comparatively short awn—fully one-eighth of an inch or so. This variety, for long thought more or less spurious, is now considered the best; being found superior in productiveness and nutritiousness to the more common tall thin sort, with pale-coloured stem and leaves, and producing seeds with long tail-like awns.

In purchasing seeds of the Italian, the awn, certainly, is the best criterion of its genuineness; but, even though there be a *small* proportion of awnless seeds, the samples must not therefore always be looked upon as adulterated; there being in many spikelets sometimes two or three seeds without awns, and the lowermost seed of each spikelet being very frequently bare. Seeds of the Italian are frequently much mixed with those of the barren fescue (known as “hairgrass” seeds), and their separation is rather difficult; it can only be thoroughly effected by a peculiar wire-sieved machine. Foreign Italian also, as imported, is in most cases very foul with weed-seeds of all kinds, and should never be sown till thoroughly cleaned.

The Italian ryegrass, these few years back, has been getting into more favour, and gaining ground rapidly upon the common species, and is now included by all intelligent cultivators as an ingredient in their mixtures, either for green-cutting or grazing purposes. Its special one great advantage is the rapidity of its growth, through which property it is eminently adapted by itself for one year’s grass or hay; and when sown in mixture with clover-seeds, a smaller proportion is recommended than that usual with the common species, as from its rapid growth, if too thick, the young clover plants are liable to be choked and killed.

To grow the Italian ryegrass in anything like perfection, the land must be in a high state of fertility. It is a plant which can stand any amount of manure, and hence its pre-eminent value when liquid manure is available; under such a system of treatment the stems will grow to a height of from 4 to 5 feet.

Specimens of a branching variety of Italian (*L. perenne*, var. *ramosum*) are frequently to be met with. This is a tall grower, and were it but constant in its form, would yield a much larger crop of seed than the common variety. It throws out three or four lateral branches at the base of the spike, bearing commonly four spikelets each.

There are some species of our native grasses which possibly might yield for a first cut an even greater bulk of produce than the Italian ryegrass, if cultivated under the same treatment of a continuous application of liquid manure—such as tall fertile fescue, broad-leaved bearded fescue, and tall oat-like soft-grass; but whether they would be as nutritious for feeding purposes is questionable; they are not so succulent, and they want that great quickness of growth to bring them rapidly forward for a second and third cut.

Home-saved Italian now weighs about 17 to 18 lb. per bushel, and is retailed at from 5s. to 5s. 6d. Imported seed is sold by the cwt. at from 40s. to 50s.

#### BEARDED RYEGRASS OR DARNEL

(*Lolium temulentum*, of the tribe *Hordeaceæ*).

Florets awned; glume of equal length, often longer than the spikelet; root fibrous, and annual.

This is the only other distinct species in the genus *Lolium* to be found growing indigenous in Britain. Although not very common in Scotland and Ireland, it is more frequently to be met with in England, and must be very common in some parts of the Continent, as its seeds are often found plentifully intermixed in samples of foreign grain. It is a most pernicious weed; the whole plant, but particularly the seeds, being of a poisonous nature.

Some varieties of the bearded or poisonous ryegrass, especially in their young state, bear a very considerable resemblance to the Italian variety of the com-



mon species ; but they are easily distinguished by the *glume* being always as long or longer than the *spikelet*—and sometimes having also a *very short thin inner glume*—the spikelets, besides, being composed of fewer florets, never exceeding four or five. The whole plant is of a stiff, upright habit of growth, and is known also in some districts under the name of *Doites*.

The seeds of the darnel, when dead ripe, are short and plump, approaching very near in form to those of wheat, and weighing nearly 40 lb. per bushel. The darnel being a *true annual*, this should in itself tend to confute the present rage of farmers for purchasing only the shortest and heaviest ryegrass-seeds, as being the best perennial.

#### MEADOW CATTAIL OR TIMOTHY GRASS

(*Phleum pratense*, of the tribe *Alopecuroideæ*).

Inflorescence paniced ; panicle erect, of a close, cylindrical, spike-like form ; spikelets small and numerous, of one floret, on very short footstalks, all around the central branch ; calyx of two equal glumes, each terminating in a short stout awn about half the length of the glume, and the keels and midribs of the glumes fringed with white hairs.

Timothy or meadow cattail is one of our best native grasses, and is common throughout the whole of Britain. It has been for many years cultivated in this country, and held in pretty high estimation, particularly in clayish-soil districts, and much more extensively, almost exclusively, in cultivation throughout Canada and the Northern States of America. The root is perennial, fibrous, but *somewhat creeping*, and on dry lightish soils often inclining to a bulbous form. The stem grows from 2 to 4 feet in height, is erect, round, and smooth, and the leaves are broad and flat, and roughish on both surfaces. Timothy is best adapted for *moist clay* or *carse lands*, and it also thrives very well upon improved *grey, moorish, and peaty soils*. On such soils, or even on all soils *above a medium in strength*, timothy should always form a proportion of the grass-seed mixture when pasture is intended ; on soils *under a medium* it is of much less value. Timothy may be said to be chiefly valuable—barring special soils and purposes—as a grazing or pasture grass ; its aftermath, unlike that of cocksfoot and some others of our best grasses, being of rather slow growth, and consequently yielding but a middling second cut of hay ; but yet the after-grass, although comparatively scanty, continues equally as nutritious as the first or flowering crop, which is not the case with the other superior grasses. Timothy is deficient in comparison with some others as an *early* spring grass, but is about equal at least in this respect to the common ryegrass, and much superior to it in some other properties—specially feeding quality. It has a higher limit of altitude than the three other superior grasses along with which it ranks—viz., cocksfoot, meadow fescue, and rough-stalked meadow-grass—being found growing about 1500 feet above sea-level, and consequently should be better suited for sowing on very high cultivated arable lands. The seeds of timothy ripen from the end of July till the first and second weeks of August.

The name “ Timothy ” is derived from Mr Timothy Hanson, an American, who was the first to bring this grass prominently into notice, upwards of eighty years ago. Its more proper name, “ Cattail,” is from the resemblance in form of its close cylindrical panicle or ear to the tail of a cat.

*Phleum nodosum*, or *P. pratense*, var. *longi-ciliatum*—a separate species with some botanists, but now generally placed as merely a variety of *P. pratense*—with *bulbous roots*. It seldom reaches more than a foot in height, the lower part of the stem being of a prostrate habit, and bent at the joints, and is usually found growing on barren sandy places ; the hairs on the mid-ribs of the glumes are longer than in the normal plant, hence the term *longi-ciliatum*. Another variety, the *P. pratense*, var. *longi-aristatum*, long-awned timothy grass, is known by the awns of the glumes being *as long as the glumes themselves*, and the *root* being also *bulbous* ; in other respects it is similar to *P. pra-*



*tense*, although frequently its ear is not more than half an inch in length, and then it much resembles *P. alpinum*, noticed below. These two varieties, which are both later grasses, along with five other distinct species, natives of Britain—viz., *P. alpinum*, *P. Michellii*, *P. arenarium*, *P. asparum*, and *P. Boehmeri*—are but of very little, if any, agricultural value. The four latter species are of very rare occurrence, and confined mostly to England; the remaining species, *P. alpinum*, is exclusively a native of Scotland, and is found frequently growing in moist situations, at a very high elevation, on several of our Highland mountains. This mountain cat-tail is seemingly considerably relished by sheep. It seldom exceeds a height of from 6 inches to a foot, and is easily distinguished by its short oval-shaped bristly panicle, which is commonly under an inch in length, and the awns being nearly as long as the glumes.

The panicle or ear of the *cultivated P. pratense* should always range from 2 to 4 or 5 inches in length; if not so, it is liable to suspicion that the seed sown has not been thoroughly pure. The best quality of Timothy seeds retail on an average about 6d per pound.

#### MEADOW FESCUE GRASS.

(*Festuca pratensis*, of the tribe *Festucaceæ*.)

Inflorescence simple paniced, the topmost four or five spikelets arising directly from the rachis, the lower spikelets on lateral branches, and the whole panicle slightly leaning to one side; spikelets of a sharp ovate form, and of five or six florets; uppermost ligule very short, obtuse, and decurrent on one side; root-leaves broad and flat, and of a lively green.

This grass is a perennial and fibrous-rooted native of Britain, and a large ingredient in the herbage of all our best irrigated meadows and most nourishing natural pastures. It grows to a height of from 18 inches to 2½ feet, and thrives best on rich and *rather moist* soils, but it is suited for and succeeds well enough on all average good land, and is much relished by every description of live stock; besides, it has not the tufty habit of growth which some of the other large grasses possess. It may be considered one of our best grasses for permanent pasture on a great variety of soils, and is also well adapted either for hay crops or pasture in alternate husbandry, especially when combined with the cocksfoot grass, rough-stalked meadow-grass, and ryegrass. The meadow fescue is most probably only a variety of the tall fertile fescue (*F. elatior*), the only difference between them being—excepting size—that the panicle of the former is simple, whilst that of the latter is compound. Along with the cocksfoot-grass it ranks next to the meadow foxtail, amongst the superior grasses, in regard to early produce in the spring.

The *broad root-leaves* of the meadow fescue, which are produced in very considerable quantity, are tender and succulent, much liked by cattle, and form very nutritious pasturage, as an instance of which it may be noted that, throughout the rich grazing district of the Vale of Aylesbury, the herbage of the most fattening pastures therein is in great portion composed of this grass. The meadow fescue flowers about the end of June, and ripens its seeds towards the end of July; and it contains much more nutritive matter at the time of flowering than when the seeds are ripe.

The four species of *Festuca*—*F. pratensi*, *F. elatior*, *F. loliacea*, and *F. gigantea*—are now placed by modern botanists in a new family, viz., *Buce-tum*, as they differ widely in some of their characters from the true *festuca*. Their root-leaves are broader than those of the stem, and the awn (when present) arises from *behind the summit* of the outer pale; whereas, in the true *festuca*, the root-leaves are narrower than those of the stem, and the awn *always* arises from the *extreme summit* of the outer pale. However, to prevent confusion, the old name is here given, as the seeds are still quoted under that name in all seed catalogues. Present retail price of meadow fescue seeds, about 8d. per pound.



## COCKSFOOT GRASS.

(*Dactylis glomerata*, of the tribe *Festucaceæ*) better known in America as *Orchard-grass*.

Inflorescence paniced; panicle one-sided; spikelets in dense globular tufts, and crowded on short footstalks; outer pale of the floret or seed with a minute point or awn; stem stout, striated, roughish, and sheathed at bottom by the root-leaves: leaves broad, rather harsh to the feel, and usually of a dull glaucous-green colour; root perennial and fibrous.

Cocksfoot is probably the best known and most productive and valuable of our indigenous grasses. It grows naturally to a height of from 2 to 2½ feet, and produces an immense quantity of nutritious root-leaves and foliage. Its only fault is, that its habit of growth is tufty, which gives a somewhat unsightly appearance to pasture-land. It is not, however, so liable to get tufty when combined with other grasses; more so when grown for hay by itself. Cocksfoot soon arrives at its full productive powers from time of sowing, and yields an extremely large bulk of hay, reproducing its herbage also very rapidly after being cut; in fact, it is the most rapid grower of all our native grasses—the meadow foxtail and oat-like soft-grass ranking next in this respect. It is well adapted to sow, either for hay or grazing, in any course of rotation whatever. When kept low by grazing, it is a most valuable grass in pasture for the first four or five years, as after that time it seems to die out if constantly depastured by cattle, more so if by sheep, and gives place to the smaller finer-leaved sorts.

The cocksfoot lives and thrives best on a medium loamy soil, giving a rather meagre return when grown upon very stiff clays or light sands. It is exceedingly luxuriant when growing in deep moist soils under the shade of trees. When grown upon a fertile loam, with a free porous subsoil, into which its fibrous roots can penetrate to some depth, it then becomes productive in an extraordinary degree; but, if grown upon a thin surface soil with a stiffish subsoil, the produce is much less, and the plants are also liable to be drawn out of the ground by the cattle when grazing, owing to the slender hold which the roots can take. The cocksfoot-grass is found to compose, in large proportion, the herbage of some of the most famed pastures in Devonshire, Lincolnshire, &c.; it yields a weight of hay much greater than that of the ryegrass, and its hay is also much superior in nourishing properties, and contains most nutritive matter when the seeds are ripe. Although coming into flower partly as early as the middle of June, it is usually the very end of July or beginning of August before the seeds are properly matured, and, on this account, the crops of it *for seeding* are often mown much too early. Irish-saved seed, in particular, is frequently very inferior in growing quality, weighing only 8 to 10 lb. per bushel, and is dear at any price; good English, or elsewhere-grown seed of 12 to 14 lb. quality, rates at from 6d. to 7d. per lb.

A few exotic species of the *Dactylis* family have been introduced, but they are of interest only to the botanist, being quite worthless in an agricultural sense. One species, called tussac-grass (*Dactylis cæspitosa*), was introduced from the Falkland Islands in 1844. It created some sensation at the time, but little has been heard of it since.

## ROUGH-STALKED MEADOW GRASS

(*Poa trivialis*, of the tribe *Poaceæ*).

Inflorescence paniced, branching and spreading equally on all sides; florets and seeds downy,—i.e., furnished at the base with a fine web of hairs; stem and sheaths roughish when felt from beneath upwards; the uppermost sheath crowned with a *long-pointed ligule*, and much longer than its leaf.

This is a very common native of moist meadows and pastures, and has a height of 18 inches to 2 feet. Its root is perennial, fibrous, but very slightly



creeping ; and shoots are produced from the root at the base of the culms, which trail on the ground and send down small roots at their joints in moist weather. These rooting shoots begin to grow pretty early in spring, but become dried if exposed to the effects of much sunshine during summer ; they however shoot out again towards the end of the season, when the weather becomes more moist, and continue green during the greater part of winter. This habit of growth fits it admirably for growing in mixture with the more upright sorts of grasses, such as Italian ryegrass, meadow fescue, &c. When grown by itself, and especially if on dry exposed situations, the produce of this grass is nothing to boast of ; but when grown in combination with other grasses—and taking into account its highly nutritive qualities, as shown, besides analysis, by the marked partiality which oxen, horses, and sheep have for it, and also the seasons in which it arrives at perfection, or rather its habit of early and late growth—it may be distinguished as the most valuable of those grasses which affect moist, rich soils, and sheltered situations. Upon the whole, *Poa trivialis*, when sown upon good land, and *in mixture with a number of other herbage plants*, may be considered one of our best grasses for either pasturage or hay. This species blooms from June till August, ripens its seeds from the middle till end of July, and contains most nutritive matter when the seeds are ripe. It yields a greater bulk of hay than the ryegrass, and by analysis is also superior to it in nutritive elements in the proportion of five to four. The price of its seeds at present ranges from 10d. to 1s. per lb.

The meadow grasses or *Poa* family include, in all, twenty-two native species, with several varieties of these ; only four of these species, however, merit much attention from having properties fitting them for agricultural purposes—viz., *P. trivialis*, *P. nemoralis*, *P. fluitans*, and *P. pratensis*. The three former are noticed separately ; the latter, *P. pratensis*, creeping or smooth-stalked meadow-grass, is an earlier grass than the *P. trivialis*, producing a considerable quantity of very early herbage, much liked by all cattle ; it is not, however, recommended for general cultivation on account of its long *creeping roots*, which much impoverish the soil, and from its herbage in a great measure ceasing to grow so soon as the seeds begin to ripen. The natural habitats of *P. pratensis* being very dry gravelly spots of soil, it may be sown to good advantage in a mixture for either hay or pasture on *light sands*, or, indeed, on all lands of so light a nature as upon which the fibrous-rooted grasses will not succeed. *P. pratensis* is distinguished from *P. trivialis*, not only by its creeping roots, but in the panicle being smaller and more open, and the whole plant usually of less size, *sheaths* being mostly *smooth*, and the *ligule* of the sheath being *short* and *obtus*e. The *ligule* is a white skin-like membrane at the base of the leaf, attached to the end of the sheath, and embracing the stem.

Another species of *Poa*, the *P. annua*—annual meadow-grass or Suffolk grass—is the commonest of all our grasses, and is found in every situation, from the lowest wet meadow to the highest dry hill-top, but in all places is considered a most vexatious weed, and is known to most persons as such in a high degree on gravel-walks, drives, and suchlike places. It blooms and matures seeds nearly the whole year round, and is particularly plentiful in Suffolk, from which county it derives one of its names.

The *Poaceæ* tribe contains seven other families besides its type *Poa*, but none of them are of much value in an agricultural sense ; the following may be shortly noticed :—*Catabrosa aquatica*—water hair-grass or whorl-grass (formerly placed by Smith and Hooker under the genus *Aira* in the tribe *Avenaceæ*)—is amongst the richest and sweetest of the British grasses, but has always been looked upon as unfit for cultivation on account of its *strictly aquatic* habits. It is found to thrive on some of the irrigated meadows below Edinburgh, where it has an abundant supply of its favourite element. A variety of this species, *C. a. littoralis*—small or sea-water hair-grass—is common in some parts on the west coast, growing usually near to or within the influence of the tide. It sends out shoots in all directions, rooting at their joints and throwing



up flowering stems; and it appears to be extremely palatable, being much sought after and eaten with avidity by cattle.

The *Briza* family, or quaking-grasses, belong also to this tribe. These possess no great agricultural value, although they have the rather peculiar property of thriving on poor and inferior soils. Their seeds soon lose their germinating powers, and are difficult to be had in any quantity.

The families of *Molinea* and *Melica*, or Melic grasses, also range under the tribe *Poaceæ*; the former growing upon damp heathy moors, and the latter in woods or other shady places upon clayish spots of soil. Neither of them is of such importance as to demand further notice.

#### MEADOW FOXTAIL GRASS

(*Alopecurus pratensis*, of the tribe *Alopecuroideæ*).

Ear or panicle erect, from 1 to 2 inches in length, of an oblong form approaching to cylindrical, compact and hairy; calyx of two glumes of equal length, united at the base, and fringed on the keels and lateral ribs; awn long, arising from near the base of the palea and projecting more than half its length beyond; glumes adhering to the seed when ripe; stem and sheaths smooth, the upper sheath slightly inflated.

This is the *earliest* spring grass of all the superior species. Its root is fibrous and perennial, and it grows to a height of from 2 to 3 feet. It is the most relished of all the pasture grasses by every kind of cattle, and constitutes the principal herbage in very many of our richest pastures and meadows. It is not very well adapted for alternate cropping mixtures, as it does not acquire its full productive powers till about the fourth year from time of sowing. It produces but a small quantity of rather scantily-furnished culms in comparison with the great mass of root-leaves; and these grow to a very large size, especially under irrigation, reproducing themselves also very rapidly, and withering little, as compared with those of the other large grasses. The meadow foxtail, consequently, having also an eminently perennial character, is admirably fitted to sow down meadow-land to be kept under regular irrigation; seeing, besides, that a meadowy soil or clayey loam, naturally of a medium degree of wetness, is the very sort of land upon which this grass grows in perfection. From its earliness and quickness of reproduction, it is found that the aftermath or second crop of hay of meadow foxtail is greater in bulk than the first or flowering crop. For *permanent pasture* also, on such soils as mentioned, the meadow foxtail may perhaps be considered *the best* grass we have.

The meadow foxtail contains most nutritive matter at the time of flowering. It flowers from the middle of May till the beginning of June, and ripens its seeds near the end of June. The seeds, from the downy glumes adhering to them, weigh very light—some  $5\frac{1}{2}$  to 6 lb. per bushel. They are subject, in some seasons, to a kind of disease, and consequently *good seeds* of this species rate high; such can scarcely ever be got under 1s. per lb. retail, generally higher.

The genus *Alopecurus* contains five other native species besides the *A. pratensis*, all of which, however, are comparatively worthless for agricultural purposes, and with the exception of one, may be classed as weeds. The *A. geniculatus*—jointed or floating foxtail—is rather common throughout Britain. It grows naturally in *wet* places of *clayey* soil, and by the edges of pools; has a prostrate habit of growth, with kneed joints from which proceed roots; and the panicle or ear is much smaller, more tapering, and of a darker colour. It is scarcely ever touched by either horses, cows, or sheep. The *A. bulbosus* and *A. fulvus*—bulbous-rooted and orange-spiked foxtail grasses—are extremely rare in Scotland, much resemble the preceding in form and habits, and are both equally worthless, or rather more so. The *A. alpinus*—alpine foxtail—is confined to some of our Highland mountains. It is known by its *short*, oval, silky-like ear, and seldom growing above 9 inches in height.



This species is eaten by sheep, which appear to be rather fond of it. The *A. agrestis*—slender foxtail—is the worst in the family, and most inferior for agricultural uses. No description of cattle seem to touch it. It is known in some districts under the name of “black bent,” and is upon some lands a very troublesome grass, being difficult of extirpation from its great powers of reproduction. It is more common in England than in Scotland, and prevails on poor exhausted soils, usually of a light nature. It is distinguished by its long, slender, tapering purple ear, and in its stem and sheaths being roughish.

A foreign species, the *A. nigricans*—black-headed foxtail—was introduced into Britain some forty years or more ago; and later was brought into considerable notice by Mr Taunton, an experimental cultivator, after whom it is sometimes called *A. Tauntoniensis*. This species is remarkably early, producing also much late herbage, through having a slightly stoloniferous habit. It may be recommended on account of its constant large produce, and also as containing a large proportion of nutritive matter.

(To be continued.)

## PLEURO-PNEUMONIA IN NEW ZEALAND.

(From the *New-Zealander*, Auckland, April 6, 1864.)

ON the 5th of April, a meeting of settlers, under the auspices of the New Zealand Agricultural Society, was held at the Criterion Hotel, Otahuhu. There was a good attendance of farmers and graziers at the appointed hour.

JOHN GRIGG, Esq., President of the Association, occupied the chair, and introduced the object of the meeting by stating that on the occasion of the last meeting, the Superintendent was not fully convinced that pleuro-pneumonia had broken out in the province. Since then, however, unmistakeable evidence had been adduced of the prevalence of this dreadful scourge in the province. That meeting would therefore have no effect in preventing the introduction of the disease, but might nevertheless be useful in arresting its progress; all that could be done was simply to take palliative measures, in order that they might be relieved from the annoyance and loss of having their cattle infected. To meet the requirements of the case, he had drawn up a series of resolutions, which he would read and submit to their consideration for adoption. He had likewise received a letter from Mr Spencer, which he would read, as follows:—

“Mangarie Road, April 2, 1864.

“DEAR SIR,—I shall not be able to attend the adjourned meeting, to be held at Otahuhu next Tuesday, on the subject of pleuro-pneumonia, being on my way to the Front on duty. I therefore write to you to state, for the information of the meeting, that several cases of this disease have occurred at some of the posts up to the Front. I am dreading to hear of the working bullocks belonging to the Transport Corps taking the disease, which of all cattle are most predisposed to take and propagate it. I still hope that if great care is used in the driving of cattle, and constant inspection, much evil may yet be averted.—I am, &c.

“THOMAS SPENCER.

“John Grigg, Esq., Otahuhu.”

The CHAIRMAN said that the first resolution to be submitted to them was:—“That this meeting is now aware, by incontestible evidence, of the presence of the infectious disease called pleuro-pneumonia amongst the cattle of this province.”

Mr ALBYN MARTIN asked if the Superintendent was not taking steps against any further infringement of the Act.

The CHAIRMAN said that his honour the Superintendent had announced his intention of carrying out the spirit of the Act as far as practicable. The Law Officer of the Government, in fact, had the matter under consideration, and no effort would be spared to work it successfully. That the disease had broken out was fully proved from the fact that out of a herd of 260 head of cattle on one



farm, no less than 26 were infected with, and had died of, pleuro-pneumonia; and another instance which had been brought under his notice, as showing the necessity for immediate action, was that of a herd of 130 infected animals having been driven into the bush secretly, to the ruin of the cattle they came in contact with. These were pronounced by the Inspector unfit for food, but were afterwards taken into the district to spread contamination around. Another proof, or one of the direful consequences, was that a gentleman had offered his farm at something like one-third its real value for the next twelve months. But the Superintendent had promised every facility, and would not shrink from insisting on the law taking its course in the case of delinquents.

Mr BASSETT proposed the adoption of the first resolution.

Mr A. MARTIN seconded.

Mr WESTON (a Victorian) here rose to offer a few observations, saying he felt a deep interest in the object of the meeting. For some years he had experience of the nature of the disease in Victoria, where pleuro-pneumonia had been very prevalent in great virulence for some time. He had not been in the province long, but he must confess that he had seen no incontestible evidence of its presence here as yet. He had watched their proceedings; through the public press he could learn nothing of its presence. As to the report of Messrs Appleton and Anderson, the veterinary surgeons, he had never seen such a lame statement; not that he doubted the presence of the disease, for his only wonder was how it had been avoided so long. As an intending settler in the province, he felt deeply the position in which they were placed, and had watched the New Zealand papers for some time to find reports of the prevalence of this damnable disease, for such he must be permitted to call it. The report to which he had alluded told them of a visit paid to a farm on the Tamaki, where, "from symptoms observed," they were of opinion the disease was prevalent, but that was surely not sufficient to satisfy the settlers; they wished to know what the symptoms were in order that they might be on their guard, and the surgeons ought to have given them in such a report as the one he held in his hand. He had himself, as he said before, had great experience in the disease. He had seen 1000 head of cattle lie dead in one camp through pleuro-pneumonia. But instead of the inspectors suggesting that the regulations be rigorously carried out, they ought to have told them how they might rid themselves of the presence of infectious epidemic diseases.

The CHAIRMAN explained that, without meaning any reflection, they had the evidence of men who were capable of judging. Mr Austin, the Government inspector of cattle, at a former meeting of that society, had informed them that he had found three head of cattle infected with the disease, and next they had the letter of the gentlemen alluded to, which announced the unmistakeable presence of pleuro-pneumonia, and said, "From the symptoms observed in the living subject, and the morbid appearance presented on making a *post-mortem* examination, they were of opinion that all the animals were more or less infected with pleuro-pneumonia, and beg to recommend that the present regulations regarding the importation and transmission of cattle from place to place cannot be too rigidly carried out, more especially until further information can be gleaned on the subject of this disease." Mr Maclean, too, had said that all the cattle were more or less infected with it: not ten head out of a herd of 260 he possessed were free from it. He (the Chairman) believed that these gentlemen were right in their testimony. They knew that beasts brought in contact with the infected animal were by that act infected, although large numbers were so constituted that they possessed the power to throw off the disease: some would even eat the carcass of an infected animal and not suffer from it. It was the simple fact of the strength of the constitution which gave the power to resist the disease. But he thought the meeting would require no further evidence of the presence of the disease than that adduced, and the evidence of the two veterinary surgeons, especially whilst they had the admission of the gentleman from Victoria that his only wonder was how they had escaped so long.



Mr WESTON again rose and said that he did not dispute the presence of the disease; in fact, as had been said, he wondered how they could dispute it so long, and should advise the gentlemen present to commence, without delay, the inoculation of every animal they possessed. This means had been adopted in Victoria and New South Wales, and was still carried on with great success.

The CHAIRMAN asked the speaker what proportion of cattle might be said to die of pleuro-pneumonia—what percentage or proportion they might expect to lose.

Mr WESTON in reply, said that depended on the weather. In cold weather the percentage would be highest, but the mild nature of the New Zealand climate there would be a considerably mitigated percentage. If the gentlemen present would inoculate every animal they possessed, he would guarantee that the loss would not be more than one in thirty. In Victoria, men went round inoculating cattle at so much per head.

Mr BASSETT said he believed they had positive proof of the presence of the disease. He was himself doubtful at the outset, but was so no longer.

The first resolution was then put to the meeting and carried unanimously.

The CHAIRMAN then read the following as the second resolution:—"That this meeting being informed that cattle have been driven from the infected herds as far as Pokeno without a certificate, express a strong censure on the persons who committed the illegal act, and trust that the full penalty of the law will be enforced against the owners of the said cattle."—His principal reason for introducing this was that a large proportion were free from disease, but they could not say how long they would remain so, whilst a herd of 700 head had been sent to Rangiapokia containing a large number of infected animals. There were other reasons to be urged, but he thought this a sufficiently strong one to cause them to support the Superintendent in his determination to do his duty. With the extenuating circumstances they had nothing to do, and they had no right to submit to the most flagrant inconvenience.

The second resolution was then adopted.

The third resolution was then read, as follows:—"That in consequence of the disease being introduced into the infected and bush districts, this meeting sees but little hope of the disease being arrested, and would therefore respectfully request his honour the Superintendent to relax the regulations with regard to the removal of cattle from one place to another, so far as they relate to provincial-bred cattle, the same not having been mixed with imported cattle; and that, in order to carry out the regulations with regard to imported cattle, the same be branded with a special brand as soon after being landed as possible."

Mr SHEPHERD asked what was to be done with imported cattle.

The CHAIRMAN said that when the disease was discovered in Canterbury a person was stationed to shoot any animal which was found infected. With regard to relaxing the regulations he thought it exceedingly onerous on the Inspector, for no amount of inspection could lead to its detection in every case.

The question was asked—Could anything be done with the infected cattle on farms?

Mr BASSETT suggested the advisability of propounding some arrangement for the removal of infected cattle.

The CHAIRMAN thought this would be met by the production of a clean certificate from the Inspector.

Mr SELBY thought it would be wise to endorse some resolution, and leave the Inspector to carry it out.

Mr BASSETT believed no measure would stop it.

Mr SHEPHERD asked the Victorian gentleman whether cattle once inoculated would take the disease again.

Mr WESTON replied that not more than five per cent. were lost after inoculation.

The CHAIRMAN said that the disease was first seen in imported cattle, and



more readily discovered early in the morning. By evening the infected beast might be driven into the interior of a district.

Mr SHEPHERD failed to discover any guarantee that other cattle were infected. He did not think the laws should be made to meet the case of the importers alone.

Mr BASSETT believed no system of inspection would prevent its introduction, and they must leave it to the Superintendent to stop the importation.

The third resolution was then adopted.

The fourth resolution was next read by the CHAIRMAN, as follows:—"That the apparent disregard of the regulations which has been manifested, either by the importers or the purchasers of imported cattle, this meeting would beg to suggest to his honour the Superintendent the advisability of greatly increasing the penalty for any breach of the regulations within the district."

The CHAIRMAN thought this was no hardship to any one; no honest man would attempt to break the laws. The power seemed large, but it was not large enough; no innocent man would be affected by it.

Mr BASSETT suggested the addition of the words, "any breach of regulations which the Superintendent may have decided to enforce."

The CHAIRMAN thought that would exclude any future regulations.

Mr A. MARTIN asked if the extreme penalty was L.500.

The CHAIRMAN replied that it was not more than L.500.

The proposition was then adopted, with the addition.

The next resolution was then proposed as follows:—"That this meeting, in support of the foregoing resolutions, begs to draw his honour's attention to the great fall in the price of imported lean stock, rendering the payment of the fine a matter of calculation only, and particularly tempting to the purchaser of infected stock, for the purpose of grazing upon the unsettled portions of the province, and that an act when so committed would be a wilful disregard of the commonwealth, and therefore a criminal act."

The CHAIRMAN thought it would not be desirable for any one to pick out a scabby sheep and leave it sufficiently long with a flock to infect the whole. He contended that the man who injured his neighbour's cattle committed a crime, and they should guard against offering temptations to the purchasers of infected stock.

The resolution was then passed.

Mr A. MARTIN moved that the resolution just passed be forwarded to the Superintendent.

Mr ROBERTSON seconded.—Carried.

The whole of the resolutions having been adopted,

The CHAIRMAN said he should be glad to hear Mr Weston's opinion with regard to inoculation, and whether cattle infected with it carried it to other parts.

Mr WESTON said considerable discussion had arisen respecting the operation of inoculation and vaccination. Inoculation was found to be the means of staying the disease; vaccination was used in the case of sheep. There was a nice distinction. The virus was formerly taken from diseased cattle, but now it was not so. The inoculation must be in the tail of the animal, taking care not to touch the vertebra; but all cattle so infected, if he must answer for them, should be done with healthy and not putrid matter. They would not save more than five per cent. of the inoculated, but might save thirty of the vaccinated.

In reply to a question from Mr SHEPHERD, Mr WESTON said that to obtain the inoculation, they must first vaccinate the animal. This done properly was a great inducement to the prevention of the disease. If it were not done so, the animal would lose its tail. But a great deal depended on the constitution of the animal and the strength of the virus.

The CHAIRMAN said they were much indebted to Mr Weston for the information he had given.



Mr WESTON said he always drew a parallel between the vaccination of a child and an animal; the child was usually sick for a few days, but rarely more.

Mr SHEPHERD proposed, and Mr BASSETT seconded, that the best thanks of the meeting be given to Mr Weston for his readiness in attending the meeting, and the information he had imparted.

Mr WESTON briefly acknowledged the compliment, stating that he had much experience of the disease, and knew the difficulties besetting its prevention: on the Murray river, even with a posse of police stationed there, they were unable to avoid its passing and ultimate spread over the district.

The usual compliment was, on the motion of Mr BASSETT, awarded the President for his services in the chair, in acknowledging which

The CHAIRMAN said there was one other matter to which he wished to direct their attention before parting, one that touched not only their pocket, but their principles as well—it was, that they should be properly represented at the forthcoming election for the district of Raglan. He only wished them to be represented by one worthy of them—one of themselves.

Mr A. MARTIN quite agreed with the remarks of the Chairman. It was necessary that a proper person should be called to the appointment, and he trusted Mr Bassett would accede to the request.

The nomination of Mr Bassett for the next election was generally supported, a hope having been expressed that he would take that as a legitimate invitation.

Mr BASSETT said that he was obliged to them for the expression of opinion he had just heard; they might have a better man—but he would, if elected, do his best to serve them. He need have no higher compliment than the expression of goodwill just uttered.

The meeting then separated.

## ADMIRAL ROUS ON "RACING AND RACE-HORSES."

TO THE EDITOR OF "THE TIMES."

SIR,—It is so difficult to comprise in one letter the arguments which are necessary to enlighten the public respecting the alleged deterioration of race-horses, owing to the modern system of light weights and short courses, that I am induced to trespass on your columns, to place the subject in a point of view consistent with common sense.

There can be but one opinion among all persons who are interested in the turf—that the grand object in breeding is to combine good size, great strength, and power of endurance with superior speed. This has never been lost sight of. Our motto is, "*Fortes creantur fortibus et bonis.*" We have succeeded in establishing a breed with one-fifth more speed and more strength than the original stock—an increased average stature from fourteen hands to fifteen and a half—in thirteen generations from the first imported stallions, Darley, Arabian, and Byerly Turk, without a drop of mixed blood; and we have a firm conviction, with ready proof, that no horses in the world can be compared to them.

On the authority of Abd-el-Kader and my Indian friends, the race of Zad-el-Rakeb, the gift of Solomon to the tribe of Azed, has not degenerated since 1720, when the calibre of the English race-horse was probably on a par with the barbs which now adorn the Gibraltar meeting. Admit this fact, and it is patent to every racing man that the best of these "divine horses," which, according to Eastern history, descended as a heavenly gift from Adam to Ishmael, Ishmael to Solomon, from Solomon to Mahomet, and from Mahomet to our own times, cannot compete with the Anglo-Arabian at a difference of five stone—a thoroughbred butcher's hack will beat the flower of the desert any distance under 100 miles.



If there is a depreciation, why ascribe it to the abolition of heavy weights, or to the substitution of shorter courses? The natural solution would be that it is owing to the sale of our most valuable stock to every country in Europe, to China, to Australia, New Zealand. But we have enough left to challenge all the world. The Emperor and the French Government are liberal in their racing prizes, and promote the improvement of the Anglo-Arabian on national grounds. They well deserve success. In Great Britain, under the cold shadow of the Crown and the Government doling out a miserable donation in the shape of encouragement, we not only hold our ground, but we advance with rapid strides. In 1843, the total amount of stakes, plates, and matches was L.199,000; in 1863 it was above L.250,000, without including the royal plates.

The deterioration of horses is a pure fiction. Stockwell, King Tom, Young Melbourne, Nabob (sold to France), and many other stallions, are framed to gallop under 20 stones. The first charges L.100, King Tom L.75, next season, for the chance of a foal. You may see in Lord Glasgow's and Baron Rothschild's stables twenty horses up to 18 stones; sixty years ago you could not have found five thoroughbred horses of this description in the United Kingdom. Fine yearling colts fetch at auction from 450 to 800 guineas if they appear likely to stay a distance and to carry heavy weights. That ought to be a sufficient answer to those persons who imagine that light weights and short courses are detrimental to the breed, and encourage "leggy weeds." How can we improve our system?

The 2700 brood mares produce about the same number of "leggy weeds" as other domestic animals, in proportion to the first class. In the human race there is a difference much greater to their discredit. As there is a national prejudice against converting horses into beef, some are kept on in training to take their chance in short races for the amusement of their owners. If "those who pay the fiddler have a right to call the tune," why are they to be abused by certain amateurs, who rarely subscribe to a racing prize, and who are never troubled with a trainer's bill? These gentlemen profess a horror for short courses, and a predilection for the old four-mile Queen's Plates, which broke down so many horses, that they were revised in 1833, 1847, and 1861. Although I deprecate a return to the barbarous system, I am a strenuous advocate for two national prizes to test the capabilities of endurance—small sweepstakes, added to plates of L.2000, to be run for at Newmarket, one the Round Course, for four years and upwards, in the first October; the other in the Houghton Meeting, the Beacon Course, for any horse carrying 11 stones, the winner of the first plate 7 pounds extra.

It is an axiom in racing, both with man and horse, that the constant habit of carrying heavy weights destroys quick action. The speed of the fastest man would be a nullity if he were employed for a year as a heavy porter.

Tailors, from the life they lead, and from never wearing heavy boots, preserve their speed. They can give 10 yards in 100 to any of the industrious classes who carry heavy burdens, as weight on the shoulders deadens the elasticity of the sinews, and stiffens the muscles of the legs.

It is equally destructive to the speed of horses. Train the fastest horse at Newmarket under 11 stones, and in six months he will entirely lose his racing form. Emblem and Emblematic, the winners of the Liverpool steeple-chase, cannot beat a moderate three-year old, at even weights, for two miles. When horses lose their speed without any apparent cause, the trainers ascribe it to the decay of nature, or to the effects of age. In ninety-nine cases out of a hundred, it is owing to exercising them under heavy lads, who have been retained in their service from charitable motives.

I admit that horses famed for running long distances are scarce, because the game is so seldom played. The heroes of old were generally small horses. The celebrated Gimcrack, in 1765, stood 13 hands  $3\frac{1}{2}$  inches. Latterly we have bred more for size and strength. From the days of Rubens, Castrel, and Selim (1810) we have looked for speed to win the valuable one-mile sweep-



stakes; but size and strength will be served when great weights are to be carried. In 1824, the speedy and magnificent Sultan beat the stout Centaur on the Round Course, at 12 stones, and 11 stones 9 pounds; but the same year Centaur turned the tables on him at 9 stones 3 pounds, and 9 stones, on the Beacon Course, and had the big one "extended" at the turn of the Lands.

Mahratta, a large, powerful horse, which could not get six furlongs at light weights in good company, could carry me, riding 17 stones, four miles under 11 minutes. He afterwards turned out a very stout hunter. This convinces me that a great-framed race-horse, which would be beaten 500 yards in four miles by a clear-winded small horse, carrying 7 stones 7 pounds each, would reverse the case to the same amount at 16 stones, when the little one could not act under the weight. Therefore, by gaining great size and strength we have adapted the Anglo-Arabian to carry heavy men across the country, and at the head of their regiments. This is the national view of the subject. It may be difficult to procure such horses, because foreign agents will give L.600 for any thoroughbred horse up to 14 stones which can bend his knees, to supply Royal and Imperial stables on the Continent.

As the price of young stock depends in great measure on the amount of prizes *in prospectu*, every withdrawal of public money affects their value. The present royal plates (insignificant as they appear) are boons to the breeder, and afford amusement to our country friends. Their abolition would be a drop of water to the revenue, which derives a great income from the turf. Calculate the sum of money which the Treasury receives in eight days from the dense crowds at Ascot and Epsom.—I am, sir, your obedient servant,

H. J. Rous.

13 BERKELEY SQUARE, June 27.

## HORSE BREEDING AND RACING.

TO THE EDITOR OF "THE TIMES."

SIR,—Admiral Rous is a great authority in all matters concerning horse-racing; but in a recent letter which I have seen of his in your journal, full of matter regarding it of interest to Englishmen, he says:—"In thirteen generations from the first imported stallions, Darley Arabian, Byerley Turk, without a drop of mixed blood," we have "a race of horses with which none in the world can be compared."

Now, admitting the latter part of this sentence to be true, it would seem from the foregoing part of this *dictum*, and people under such authority as the Admiral's would come to the conclusion that our best horses are many generations from the Barb and Arab.

But such is not the fact; and it is to prevent this notion spreading that I venture to challenge Admiral Rous's implied opinion, and ask you, Sir, to give insertion to this letter with the view of combating such a false notion, and to stifle the sneers of some other late writers upon Turf matters who have inveighed against Barbs and Arabs, as it appears to me ignorantly, if not unfairly. I cite a few instances to prove that some of our best horses are very nearly allied to the Barb and Arab too—viz., The Colonel, who ran a dead heat for the Derby with Cadland, and who won the Doncaster St Leger afterwards, being then the property of the late Mr Petre, afterwards purchased, at a great price, by His Majesty George IV.; Merlin, a very superior Newmarket horse, the sire (I believe it will hardly be disputed) of the best horse in this century—Plenipotentiary, although that horse was attributed to Emilius as his sire; Buzzard, a very good racehorse, out of an own sister to the foregoing, the property of the late Lord Durham; and Falconia, a mare I bought of the late



Mr Shard, and sold to the late Field-Marshal Grosvenor, and who, he told me, was as good as Glaucus (in his stable at the same time,) were all out of Delpini mares. And how was Delpini bred? Delpini was by Highflyer out of Helen by Blank; Blank, by the so called Godolphin Arabian—in fact, a Barb; and Highflyer himself got by Herod out of a Blank mare, and, moreover her dam by Regulus; Regulus as well as Blank being by the Godolphin Barb. So that Delpini had three immediate crosses of the Barb and Highflyer two. Then, again, Lilius, afterwards called Babel, won the Oaks; and her own sister, Translation, ran second for the Oaks another year. Her half-sister, Dardizette, second another year, and her (Dardizette's) own brother, The Exquisite, second for the Derby another year; and these four were out of a Wellesley gray Arabian mare, her dam being by Highflyer (with the two crosses of Godolphin), and her grandam, Nutcracker, by Matchem, by Cade, a son again of the Godolphin. Why Lord Rous's Quiz was out of a Matchem mare, a great horse. Bennington, by the Northumberland Arabian, was a good horse, and there are others.

So much for the outcry against Barbs and Arabs. The fact is, there is as much difference among Barbs and Arabs as there is between our native-bred horses.

The Godolphin Barb's excellence was only discovered by accident, by his being put to a good mare, Roxana; and so it would have been with other well-bred Barbs if they had had us good a chance as the Godolphin.—I am, Sir, your obedient humble servant,

J. J. W. ANGERSTEIN, Lieut.-General.

London, July 1.

---

TO THE EDITOR OF "THE TIMES."

SIR,—Is the racehorse as good now as during the last century?

Admiral Rous tells us that since 1720 to the present time the racehorse has, on the average, increased in stature from 14 hands to 15½ hands, and in speed one-fifth. The admiral takes his period after 1700, and names the Darley Arabian and his produce, of course in exemplification of his statement that horses were then small and comparatively slow. Surely he must have forgotten that the Darley Arabian was the sire of Childers, perhaps the fastest and stoutest horse which has ever yet appeared on the Turf.

Childers is said to have been 16 hands high, of great bone, and of such speed and endurance that his racing career was very short, from the want of competitors. He beat all other horses at four miles and six miles, and at high weights. When six years old he ran a trial over the Round Course at Newmarket, carrying 9 stone 2 lb., in 6 minutes 20 seconds; and he ran over the B.C., 4 miles, 1 furlong, 138 yards, in 7 minutes 30 seconds.

At about the same period, 1720, there were likewise many large and stout mares; for example, Bald Charlotte, who is described as of shape and beauty, also of size, with much power; and her power was exemplified by her running four miles at Newmarket, carrying 18 stone against a horse carrying 17 stone 7 lb., and this she did with impunity, coming out very shortly afterwards in long races with high weights; and it appears there were other stout mares, as she started in a King's Plate with twenty-seven others, carrying 12 stone each. Thus, at about the time of the Darley Arabian, there were good and stout animals, and of size. Then we come to another and later era,—namely, that of the Godolphin Arabian, and to the present day there is hardly a superior animal who cannot be traced back to some of his blood. The Godolphin Arabian (a Barb) was the sire of the dam of Eclipse, a horse of much size, bone, and muscle, whose speed and endurance were very great, so great that no horse had any chance with him in running four miles at high weights; but his fame is known to everybody who took any interest in the racehorse. It may be said, we all allow, that Childers and Eclipse were wonderful horses; but do they stand alone? No; there were St Peter and Highflyer, and others of great size and speed in



the last century. The Admiral certainly says that the average was so and so; but how can an average be obtained either of the past or present time? We can easily name the famed animals of the last century, and so we can of the present time and compare them, so I should be pleased to hear of superior horses to Childers, Eclipse, St Peter, Highflyer, &c.

If we are to improve one-fifth on the size and speed of Childers we must have a horse 20 hands high, and capable of running the B.C. in six minutes. It may likewise be observed that the horses named of the last century were chance animals. If this argument is of any avail we must now have a better chance of getting such animals, as there are perhaps twenty foals bred now to one prior to 1800.—I am, your obedient servant, J. G.

It will be observed that of the best two horses, Childers and Eclipse, Childers was got by an Arab (or Barb), and the dam of Eclipse by a Barb; in fact, all the best blood of old ran close into the Barb or Arab, producing, it is submitted, animals superior to any we now possess.

---

### THE BREED OF IRISH HORSES.

The following letter has been addressed by Robert Browne, Esq., the Ranger of the Curragh, to Mr John R. Hunter, Keeper of the Match Book and Secretary to the Turf Club:—

“Upper Mount Street, Dublin, July 11, 1864.

“SIR,—I received your letter and a copy of resolutions passed unanimously by the Stewards and Members of the Turf Club, on the 2d of July, wherein they state that they do not concur in the opinions expressed in a memorial addressed by the Horse-breeding Committee of the Royal Agricultural Society to the Government, that it was uncalled-for and ill-advised. Other observations respecting the members of the committee, unnecessary to introduce, were contained in them. Others stated that the merits of the Irish race-horses had not declined, &c. &c. As I, at the request of the Agricultural Society, formed one of the committee alluded to, and fully concurred in the opinions which they, after considerable trouble and lengthened investigations, thought fit to present, as I am informed, to Her Majesty's Government, I do not wish it to be supposed that I in any way have changed the opinions then entertained and expressed by me to the committee with whom I had the honour of being associated for some time. I adhere to every opinion which I then gave, and which, had an inquiry been instituted, I was prepared to support as regards the deterioration of racehorses in Ireland. Independently of the few racing authorities which now are to be found here, I refer to the English and Irish “Calendars,” by which it will be seen that the running of the few Irish horses which are in training in this country has been wretchedly bad, even with horses which did not reach mediocrity in England, a few excepted. At the April meeting, 1864, on the Curragh, Deerstalker fully established his superiority over our three-year-olds; there were no horses over that age. In June, the Lawyer, half trained, and very groggy, won the two Queen's Plates very easily, beating the best horses that could be brought against him. Had he not broken down in the race against Caroline, notwithstanding which he won, he would, I think, have walked over the two remaining plates. A reference to the “Racing Calendars” will show how few second and third class horses have been sold from Ireland within, say, the last twelve years. A few speedy handicap horses have won at light weights and short distances; I cannot recollect any three or four mile horses, except Bally Edmond, who has won a Queen's Plate, or even a L.100 weight-for-age plate, two miles. The Stewards, and the three members of the Turf Club, who were present when the resolution was framed, passed, and published, have declared it to be their intention to apply themselves to the



revival of horse-racing. The very word revival adopted by them proves the entire case for the Horse-breeding Committee. Strange as it may appear to those who are old enough either to have seen or read of horse-racing some years back, I venture to say that at this moment there are not above five three-year-olds in Ireland, one four years old, no five, six, or aged horse, in training, that can, in the estimation of a competent judge, be considered as deserving the appellation of a plater, or who would be approved of for stud purposes. I regret my differing so decidedly with the members of the Irish Turf Club. I preferred absenting myself from the meeting on the 2d of July, to opposing any object which I could not alter or avert. The high character of the noblemen, gentlemen, and of the military officers who formed the committee, and who so zealously procured reliable information for its consideration, precludes so humble an individual as I am from making any observation beyond requesting a reference to their names. I may add one remark, so pleasing to Irishmen—viz., that none of them, except the officers of the army, are *absentees*, all are resident landlords. I much regret that the objects for which the meeting, signed by me, was convened—viz., the reformation of the Turf Club before it becomes extinct, and an alteration in the courses, which would enable spectators to see Her Majesty's Plates run for, were altogether lost sight of. As you published your letter to me, I have to request that you give the same amount of publicity to this, my reply.—I am your obedient servant,

“ ROBERT BROWNE,

“ Ranger of Her Majesty's Curragh of Kildare.

“ John R. Hunter, Esq.,  
Secretary to Turf Club.”

## HORSE BREEDING IN IRELAND.

(From the *Sporting Life*, July 1864.)

TO THE EDITOR OF “ THE SPORTING LIFE.”

SIR,—The repeal of the Union has been the standard Irish cry ever since I can remember, and, after a couple of failures, with a vast amount of censure on the Government, the Galway contract is once more a bone of contention. The matter, however, which most concerns the readers of a sporting journal is the agitation respecting the deterioration of Irish horses. In the month of November 1863, one or two Irish gentlemen were suddenly struck with the idea that good horses were very scarce in the “ould country,” and they forthwith communicated this opinion to many more alike interested in the breeding and sale of horses. A committee was formed, and a meeting held, at which much speech-making took place. Several gentlemen exposed their entire ignorance of the subject, others proved by their remarks that they were more *au fait* at the business; but many of the main points—those which would have tended to bring about improvement in the state of things, namely, the increase in the number of good horses—were the least prominent features of their discussion. The omission has been still apparent at their subsequent meetings, for the reason that in order to grapple with an evil something more than mere talk is necessary from this committee of influential landowners. If a man has money and judgment with the right sort of land at his command, it is the easiest matter in the world to produce good horses in almost unlimited numbers. Why have the committee allowed this season to pass without making some decisive move to carry out the object which they met to discuss in December last? The covering season of 1864 is no sooner over than the “cry” is once more raised. Horse-breeding, with good judgment and a liberal system of feeding young stock, will pay in Ireland better than in England, not only because land and labour is cheaper, but for the reason that Irish-bred horses (especially of the hunter and charger class, for which the country is most famed) are preferred by both Englishmen and foreigners to those bred and reared on their



own soil. It would have been better policy for Irish gentlemen to have abstained from the publication of their proceedings at these committee meetings, which have only tended to lower the *prestige* which for ages has ever attached to Irish horses, whether hunters, racehorses, or troopers, and the wisest course for them to have pursued when they noticed the scarcity of good horses, which has been gradually but surely made apparent through the increased demand, would have been to rely upon themselves individually. I recognise many members of the committee who have money, land, and the necessary judgment to produce better horses than thousands of the tenantry of their country have done before them, because they can afford to feed them better while growing. The breeding of horses is surely not such a difficult matter as to require a six months' parley, and I am certain that a thousand committee meetings and an acre of newspaper paragraphs, compiled by the most practical writers of the day, would fail to influence the farmers of Ireland, by whom all the best horses are bred, for there are very few gentlemen who have hitherto had enough energy to establish a breeding-farm on their own account. Every farmer who rents land sufficient for the purpose will naturally be alive to the extraordinary demand for good horses, and if it remunerates him better than by turning his ground to the ordinary purposes of agriculture, he will doubtless pay increased attention to breeding, and if (as the committee assert) the horses he has hitherto produced are so deteriorated in value as not to be marketable, he will, if he has common sense, set about repairing the error he has made as soon as possible. If he has no common sense he is in a hopeless condition, and neither committee meetings nor anything else will be of much service to him, as a natural fool should find more suitable employment than breeding horses. I deny the assertions of some members of the committee that "Irish farmers do not know a good horse when they see one," for it is mainly by farmers that the best horses have been bred. But if the Irish farmers are so ignorant of the business, why do not the gentry of the same class as the committee enter more spiritedly into the thing and remedy the error? Why do the Irish gentry continue to sell nine out of every ten of their best horses to Englishmen or foreigners, and go on aggravating the evil which they are puzzling their brains to remedy? Hundreds of the best brood mares in Ireland have been, during the last few years, purchased by Mr Murphy, of Montpelier Hill, Dublin, for the Austrian government, and very many have been sold to agents of other governments. The demand has been so great of late years that young stock likely to make stallions or brood mares, have been recklessly sold to foreigners (for the ostensible purpose of making troopers at less than half their value), until the farmers have nothing left to breed from. The deficiency principally applies to mares. One mare can only produce a single horse per year, several are barren, and many even of the best-selected mares may fail to throw a foal good enough for a foreign customer. An immense number, therefore, of good sound mares are required to produce horses sufficient to satisfy the demand upon the Irish market. If the committee had met three or four years ago, at which period it must have been clearly apparent to them that Ireland was constantly being drained of the best brood mares, and some remedy suggested to stop the evil, it would have been better than meeting to lament the scarcity of good horses after the mischief has been done.

The late Marquis of Waterford had the largest breeding-stud of any nobleman or gentleman in Ireland, and for a lengthened series of years he devoted close attention to the breeding and improvement of hunting and thorough-bred stock. Every year he gained more experience, and, had he been spared, both racing and breeding would now have been in a much more flourishing condition. The present Marquis, though by no means so great a lover of horses as his brother, has acknowledged the importance of retaining a small selected stud for breeding purposes, and every year, at Curraghmore, the services of very useful stallions can be secured on reasonable terms. Janus stood here in 1861, and Lord George and the Duke of Suffolk were the sires of 1863. The stud of the



late Marquis was sold at Curraghmore, in June 1859, and nearly all the best brood mares were permitted to leave the country. Mr George Bryan of Jenkinstown Park, acted as the agent for the Hampton Court stud, and he secured three of the best mares—Ossifrage, by Birdcatcher, out of Sultana, with a filly-foal by Hobbie Noble, for L.100; The Deformed, by Burgundy or Harkaway, who had been a winner in England, Ireland, and Italy, he got for L.360; and Peri, by the renowned Birdcatcher, a very handsome, powerful mare, with a good foal by Hobbie Noble, many of the gentlemen who form the "committee" stood by and saw almost given away to leave the country for L.280. This was about the same price as her yearling colt, by King Tom, fetched at the Royal Paddocks on June 4 last, on the same day that the filly-foal out of the Deformed, by Orlando, sold for 300 guineas. Juanita Perez, a very powerful, racing-like mare, the dam of Drogheda, was also purchased at Curraghmore by a son of a member of the committee, for Mr Weatherby, at the low price of L.350. So much for Irish enterprise and national pride in the matter of horse-breeding. There are, however, some very useful stallions in Ireland, and if the farmers will observe the necessary care in the selection of sound half-bred mares, the produce from most of the stallions in Ireland will return him a remunerating profit for his outlay and trouble. Mr Quin, of Loughloher Castle (Tipperary), had, a few years ago, a stallion called Bryan Borhoime, by Potemkin, a perfect hunter himself, and the sire of some good hunters, carriage-horses, and chargers. He is now, I believe, either dead or left the country. The same gentleman owned Coranna, dam of Agitation, a very good mare, sold by Mr Quin for exportation to Germany, and she afterwards won 2400 sovereigns, in two stakes, at Pesth, near Vienna, beating many good English horses. Mr Quin also bred Whiff, a descendant of Lanercost. This horse is now the property of his tenant, Mr Michael O'Brien, of Ballindonney Castle. For the last two or three years, another good horse, British Lion, by the Flying Dutchman, out of Attraction, a Touchstone mare, has been kept at Loughloher. This horse's stock is very promising, and all his yearling fillies were sold last year to Count Cavaliero, the gentleman who purchased Fandango and several brood mares at the late Sir Tatton Sykes's sale. Mr H. W. Briscoe, of Tinane, has done much to improve the breed of horses in Ireland. He imported from England Great Heart, sire of Gaylad, Titterstone, Ace of Hearts, Sweetheart, and Lightheart, winner of the Kildare Hunt Steeple Chase last year, beating five-and-twenty of the best horses in Ireland over four miles of country, as also the Downshire Cup (three miles and a half), beating ten more horses, the day after. Mr Briscoe also imported Red Hart (sire of Zadlee and Imitation), and he sold two colts of this horse's get for L.300 to go to Australia. Red Hart was the sire of Field-Marshal, sold to go to India at a good figure; Captain M'Craith sold a two-year-old hunting colt by him for L.300, and many more of his stock have realised good paying prices. Mr Briscoe also imported Damask (sire of the very clever steeple-chase mare New Broom), Charles the Twelfth, (sire of Fire-eater, &c.), Confessor (sire of Anfield, for whom Mr Hewitson, of Piltown, got L.100 at nine months old), Legatee, by Pompey, Hospodar, afterwards Greyleg (sire of The Clown, a well-known steeple-chase horse), and Motley. The last horse purchased by Mr Briscoe, and now standing at Tinane, is St David, by Ballinkee, out of Esmeralda, dam by Cain. This horse was the winner of more than thirty races under heavy weights, and will therefore be a boon to the country where he is located. It is to such men as Mr Briscoe that Ireland has ever been most indebted for upholding the breed of Irish horses, by constantly importing fresh blood. Another gentleman who deserves honourable mention is Mr George Malcolmson, who has imported some good stock from the most celebrated trotting blood; he is establishing a stud in the vicinity of Portlaw.

Much that I could write with reference to the cause of the decline of racing in Ireland is necessarily deferred until a future opportunity; but here I may state that the gentry of the country are partially to blame for exporting all their



best horses to England, and for permitting the notorious bad management at the Curragh meetings to continue year after year until few horses but platers are left to run for the public money. The sires at present standing at the Curragh are Claret, by Touchstone (the property of Mr Groves, of York); Colonist, by Melbourne; Gray Plover (brother to Chanticleer); Ivan, by Van Tromp; Artillery, by Irish Birdcatcher; Druid, by Mountain Deer; and, Prizefighter, by Tearaway. There are also distributed over various districts, Sampson (sire of Sly Fox), Araguthsheese (which signifies in Irish "ready money"), Newton-le-Willows (a fine stallion for getting hunters), Roebuck (a good hunter and steeple-chaser himself), Audubon, Dr o'Toole (sire of Bellmain) Tower, Wild Irishman, Marquis, King Dan (sire of Con Cregan, Miss Maria, Anatis, &c.), Trabuco, Porto Rico, Planet, Old Fashion, M.D., Tom Steel, Stroud, Sugarplum, Farnham, Tearaway, Bantam, De Ruyter, Brandy, Ducan-Dhurras, Chit-chat, Chicken, Gamekeeper, and several others whose names I cannot recollect.

It will be seen from the above that Ireland is not so exceedingly deficient in thorough-bred sires, which the farmers will no doubt turn to account while the enormous demand exists. It is the dearth of brood mares that is causing the scarcity of good horses, and to this subject both the gentry and farmers must devote their attention, always being ready to purchase and put down the money whenever and wherever they see a suitable animal for sale, in addition to keeping what they have already preserved out of the wreck at home. They must also be regardless of all attempts to induce them to sell for exportation until they have a numerous stud of first-class mares left in the country as a nucleus to breed from. By this system, and this alone, they may hope to redeem their character as the best breeders of hunting stock and troopers in the world.

BALLINASLOE.

## ACUTE INDURATION OF THE SPERMATIC CORD.

By M. RENARD, Veterinary Surgeon at Issoire.

(From *La Clinique Vétérinaire*.)

THE subject of this disease was a seventeen-year-old mule, and the tumour, which existed in the right inguinal region, was the size of an infant's head.

The mule had been castrated at three years old. Some days after the removal of the clams, the proprietor having noticed a slight swelling of a lively red colour, and suppurating freely, situated on the right cord where the clams had been applied, again called in the operator, who effected its partial removal, and secured the healing of the wound in the course of a few days. The means employed were unknown.

There remained, however, an enlargement of the size of a turkey's egg, and during fourteen years it continued of the same size. On the subject being put to severe work, the swelling became more painful, but this usually disappeared in the course of a few days. Two months before it was shown to M. Renard it began to increase in size,—at first slowly, but soon so rapidly that in eight days, it had increased from the size of a fist to that of an infant's head. The mule now became weak, walked with a straddling gait, and refused all food for three days.

M. Renard found the animal much emaciated, with a dry staring coat, hanging head, indicating great prostration; injected conjunctiva; small, hard, and accelerated pulse, and a peculiar beating and tucked-up condition of the flank. Breathing was accelerated, and expiration made with a double effort, as in a bad case of broken wind. The loins were arched and insensible, and the posterior members widely separated. The tumour was hard, hot, and very tender, and the skin of the scrotum tense and glistening. The tumour had an oblong outline, and was suspended by a pedicle of the thickness of the arm, very hard, and extended upward at least as far as the inguinal ring. No examination was made per ano, to see whether it extended into the abdominal cavity.



*Diagnosis.*—Acute induration of the spermatic cord.

*Prognosis.*—Very serious when we take into account the activity of the symptoms, the age of the animal, and the state of prostration.

*Treatment.*—The excision of the tumour was recommended, without hiding the dangers of such an operation. Next day the operation was performed.

The mule having been cast and fixed as for castration, the scrotum was freely laid open with a bistoury, and a reddish serous fluid escaped from the interior of the tunica vaginalis. Numerous adhesions between the two layers of this tunic were broken up with the fingers or a bistoury, and the entire tumour exposed. Strong clamps were placed on the cord, as high as possible, and about three-fourths of the entire diseased mass removed. It had a reddish-yellow colour, and seemed formed of concentric layers. Its consistency was equal throughout; at no point was there any appearance of softening, and there was only the merest remnants of the cord.

No untoward symptoms appeared, and the mule went to work several days after the operation. It is now four years since the excision of the tumour, and, up to the present time, there is no induration of the cord perceptible externally,

The following conclusions are drawn from this case :—

1st, That induration of the spermatic cord may continue for an indefinite length of time without undergoing any change.

2d, That a violent pain in the inguinal region leads to movements of the flanks similar to those of broken wind.

3d, That compression of an indurated portion of the cord, established with the view of procuring the elimination of a champignon, may effect a cure, provided the induration is not complicated by abscess or fistula.

## PARTURIENT FEVER.—VITULARY FEVER.

By M. TH. VANDERSCHUEREN, Government Veterinarian at Grammont.

(From the *Annales de Médecine Vétérinaire*, May 1862.)

VITULARY fever was very common during the year 1861, and, as it carries off a great number of the best milkers, it has for a long time claimed M. Vanderschueren's attention. From the observation of a large number of cases, and numerous autopsies, he has been led to form the following opinions concerning the disease.

It is an affection proper to the milk-cow, appearing usually from the first to the third day after calving,—sometimes immediately after, but rarely before.

For fifteen or twenty years it was seen only in the stock of the small farmer, whose cows are treated with the greatest care, are heavily fed on cut food, and are, in a word, surrounded by all those circumstances which predispose the economy to an abundant secretion of milk. From year to year it has become more frequent, and now it is equally common in the larger stocks, and has assumed a virulence that makes it the terror of the stock-owner.

By different veterinarians this disease has been considered to be a metropéritonitis, an acute indigestion, a nervous affection, a cerebral apoplexy, &c. Most practitioners hold to the last named opinion, but the diversity of the opinion generally entertained sufficiently shows that its true nature has been a mystery.

In a great number of autopsies our author discovered no lesion; sometimes he found traces of inflammation of the peritoneum, the uterus, the digestive organs, or the thoracic viscera, but very often in a manner too little marked to permit of the idea that this had caused death. He has, in certain cases, noted the presence of a clot of blood on the medulla oblongata, but rarely these lesions which characterise cerebral apoplexy.

These different results shut out any one of the above-mentioned conclusions, and, added to a great number of practical observations, led M. Vanderschueren to conclude that it really depends on an infection of the blood that has taken



place during gestation, and the development of which is, in the great majority of cases, caused by the process of parturition. In some cases, as already noticed, it occurs before calving.

Parturient fever is thus to be considered as a primitive alteration of the blood, with a great disorder of different functions, and extraordinary nervous excitement,—in a word, all the train of alarming symptoms which show themselves as the result of a general reaction, and which betrays the presence of a morbid element in the circulation.

The variable terminations, and, above all, the metastasis observed during the course of the disease, also favour this opinion.

In some cases M. Vanderschueren has seen all the febrile symptoms disappear, and give place, after a time, to a secondary affection, altogether distinct from the primary one, and which invariably proves fatal in a few days. Again, he has frequently seen an abundant discharge of urine or fæces marking the crisis of the disease.

It is commonly the chest to which the metastasis takes place, the pleuræ, lungs, and pericardium, being often simultaneously attacked, while in one case only has a gastro-enteritis ensued.

These secondary affections are all of the same stamp: they are sub-acute and sluggish in their course, they obstinately resist all curative measures, and have often extensively undermined the vital powers before giving any marked symptoms of their existence. The autopsy demonstrates extensive lesions, such as abscesses, false membranes, &c.

In many cases, however, in which a cure has not been effected, the duration of the malady is too short to permit of metastasis having taken place, at least in a noticeable manner, and the cow is carried off by the fever before the morbid element has been determined to any particular organ. In this case few lesions are observed on making an autopsy, and this is the common condition of things.

It is worthy of note, that when the fever of reaction is slight, and marked by a small and slightly accelerated pulse, the disease ends fatally, the efforts of the economy being too feeble to rid it of the morbid agent.

If a cow calves with difficulty, or if the after-birth is retained, the malady need not be feared; and if by exception it does occur, the symptoms are not so violent, and the cure is easy. The irritation of the generative organs, in such cases, constitutes a point of revulsion, followed in all cases by a sero-purulent discharge, by which the noxious agent is eliminated.

The causes of the affection are also little known. It is generally attributed to a plethoric condition; but the condition of plethora is far from being indispensable, as the disease will attack animals in middling, or even in poor condition. It does not occur after the first or second calving, but attacks beasts only at a more advanced age, at which there is a greater aptitude for a large secretion of milk. There must be admitted as a predisposition a peculiarity of the economy, which is at the same time necessary to constitute free milking powers, so much so that this last property is inseparably connected with those conditions that induce the malady. The increasing frequency of the disease has kept pace with the improvement in the milking quality of the animals kept, and of late this amelioration has been effected to a large extent, chiefly through the extensive introduction of Dutch cattle, which, as a rule, are heavy milkers. It may be further worthy of note, that these pure Dutch cows are much more subject to the disease than others.

This disease is like others, and especially those of the circulatory fluids, to be largely affected by general causes. During the first half of last year disease in general was more than usually prevalent, and this remark holds good quite as much of puerperal fever as of any other affection. It was also much more acute than it usually is, and carried off large numbers so rapidly that there was no time for the employment of therapeutic measures.

There was, at the same time, a marked increase in the fatality of the diseases of calves.



The same thing was very noticeable in 1859, in the first half of which almost all the cases met with recovered; whereas, in the latter half of the year, they died almost indiscriminately, though subjected to the same treatment.

In summing up, M. Vanderschueren gives as his opinion that plethora, while it favours the development of the malady, is insufficient of itself to cause it without the concurrence of a special condition of the economy; and that, when this condition is powerfully marked, the plethoric state is not absolutely necessary to induce the affection. Gestation is a condition indispensable to the generation of the malady, and, in the great majority of cases, parturition is the determining cause. Lastly, it only attacks beasts that have attained a certain age and full maturity.

In treating the disease, our author has found the greatest number of recoveries from purgatives (sulphate of soda and tartar emetic) and diuretics (nitre and tartar emetic). General bleeding, more or less, according to the indications of the case, not having been forgotten. He did not bleed when the fever was not intense.

The proportion of recoveries is, however, far from satisfactory. The duration of the malady is usually too short to allow time for the operation of therapeutic agents, which is hindered by the complex gastric apparatus of the cow, together with the hoven, the profound coma, and the stagnation of the functions of the digestive and urinary systems during the fever.

Preventative measures are the most efficacious, and among these purgatives and diuretics before calving, have proved very successful. M. Vanderschueren has found them about equally successful. The best time to give the purgative is two days before calving, in order that it may be repeated should the first fail to act. Diuretics are employed from six to ten days before calving; given in small doses, and repeated several times a day.

Bleeding and dietetic measures have not given any satisfactory prophylactic result.

The following are some of the cases recently met with:—

*First Case.*—On 10th November last, the fever attacked a Dutch cow belonging to M. Clement, Overbouldaere, Basemont. She was in the prime of life, in middling condition, and had calved easily the previous day. The fever was violent, and she was accordingly bled from the jugular, had 300 grammes of sulphate of soda, with 8 grammes of tartar emetic; a quart of linseed decoction hourly; aloetic injections, and dry warm clothing.

Next day the coma was greater, and the fever in no wise relieved. Administered 180 grammes of sulphate of soda, and 4 grammes of tartar emetic. Injections were continued, and the linseed decoction given every two hours.

On the 12th the coma had completely passed off, and the cow sought to feed. A certain quantity of urine was passed, but the pulse was unchanged. The injection and linseed decoction were continued. Towards night the owner noticed her getting weaker, and she died at two o'clock next morning.

The autopsy showed that the brain and its envelopes were perfectly sound, the pericardium bore traces of violent inflammation, and the interior of the heart was normal. The abdominal viscera were healthy, except the uterus, which was acutely inflamed, and the cotyledons were gangrenous.

*Second Case.*—On 11th November a cow was attacked, the property of M. Van Lierde, Everbecq, six years old, and in very high condition. She was an excellent milker, and was besides employed for draught purposes on the farm. She had calved two days previously very easily. The pulse was very full and rapid, but there was little coma. She was bled to the extent of seven pounds, and otherwise treated like the case last described. Next day there was a sensible improvement, and an abundant secretion of urine. The injections and linseed decoction were continued, and a little food allowed. On the 13th, the cow had completely recovered.

*Third Case.*—On 11th November the fever attacked a cow of Widow Marthys, Overbouldaere, Duyeschenbrock. This subject was small, eighteen years old, and



in very poor condition. There was deep coma, a small, slightly accelerated pulse, little febrile reaction and cold extremities. She had 300 grammes of sulphate of soda with 6 grammes of tartar emetic, aloetic clysters, and decoction of linseed every hour, dry frictions upon the surface, warm clothing, and two setons in the dewlaps. The cow died toward midnight.

At the autopsy the cerebral structures were found to be quite healthy, as were also the thoracic and abdominal viscera, except the uterus, which showed some slight traces of inflammation.

## THE CATTLE DISEASES PREVENTION BILL.

THE following is a copy of the Cattle Diseases Prevention Bill as amended by the Select Committee. The bill is entitled "A Bill to make further Provisions for the Prevention of Infectious Diseases amongst Cattle;" and its preamble states that "it is expedient to consolidate and amend the law for the prevention of the spread of contagious or infectious diseases amongst cattle in the United Kingdom of Great Britain and Ireland."

### PRELIMINARY.

1. This Act may be cited for all purposes as "The Diseased Cattle Act, 1864."

2. This Act shall apply to the whole of the United Kingdom.

3. In this Act "cattle" shall include horses, mules, asses, neat cattle of every description, sheep, goats, and swine.

4. For the purpose of this Act the expression "contagious or infectious diseases" shall be deemed to mean the several diseases mentioned in the first and second schedules hereto, and the term "diseased" shall mean affected with any contagious or infectious disease mentioned in either of the said schedules.

### PART I.

#### GENERAL LAW AS TO DISEASED CATTLE.

5. *Public Exposure of Diseased Cattle.*—If any person—

- (1.) Turns out or leaves turned out in any forest, chase, wood, heath, common, open field, roadside, or other undivided or unenclosed land, any cattle affected with a disease mentioned in the first schedule hereto; or
- (2.) Takes any cattle affected with a disease mentioned in the first schedule hereto along any highway without using all practicable precautions to keep them separate from the cattle of other owners; or
- (3.) Exposes for sale any cattle affected with a disease mentioned in the first schedule hereto in any market, fair, or other place, whether public or private, where cattle are commonly exposed for sale, or brings the same for the purposes of sale into any such market, fair, or other place as aforesaid; or
- (4.) Brings any cattle affected with a disease mentioned in the first schedule hereto into the stations or within the premises of any railway, boat, canal, or other company, or of any other common carrier of cattle; or
- (5.) Places any diseased cattle in the stable or other buildings of an inn, or in any other stable or building, without having given notice to the occupier of such stable or building of the existence of diseases in the cattle, and obtained his permission to place them there;

knowing the existence of disease in any animal to which this section applies, he shall be liable in respect of every such offence to a penalty not exceeding twenty pounds; and any Justice of the Peace may, upon the application of any con-

stable, or of any owner of cattle or his servant, or of any owner, lessee, clerk, inspector, or other officer of any market or fair, or of any officer of a railway, boat, canal, or other company, or of any common carrier of cattle or his servant, make an order directing any constable to remove any cattle affected with a disease mentioned in the first schedule hereto to a place where they can be safely kept without risk of infecting other cattle; and all expenses incurred in the removal may be recovered from the owner in a summary manner. The owner of any cattle in respect of which an offence may be committed under this section shall be liable to the penalty hereby imposed, unless such owner proves to the Justice or Sheriff before whom the offence is tried that such offence was committed against his orders, and without his privity or consent, and in such case the person actually committing the offence shall be liable to such penalty.

6. *Market for Cattle affected with certain Diseases.*—Any such local authority as is hereinafter named may set apart, within the limits of any market or fair, or elsewhere within their jurisdiction, a place for the sale of cattle affected with any disease other than a disease mentioned in the said first schedule; and whenever a place shall have been so set apart, and publicly notified, any person who shall expose for sale any cattle affected with a disease mentioned in the second schedule, within the limits of such market or fair, except in such place so set apart, knowing the existence of any such last-mentioned disease in any animal so exposed, he shall be liable in respect of every such offence to a penalty not exceeding five pounds.

7. *Prohibition of feeding Swine on Uncooked Flesh.*—If any person gives or causes to be given uncooked flesh for food to swine, or wilfully allows swine to get uncooked flesh for food, he shall be liable to a penalty not exceeding forty shillings.

## PART II.

### SPECIAL PROVISIONS AGAINST EPIDEMICS IN CATTLE.

8. Her Majesty may, by Order in Council, make regulations with respect to the following matters:—

- (1.) The prohibition for regulating the removal from any specified part of the United Kingdom, of cattle, or of the meat, skins, hides, horns, hoofs, or other parts of cattle, or of hay, straw, fodder, or other articles likely to propagate infection.
- (2.) The examination of any cattle, or of any meat, skin, hides, horns, hoofs, or other parts of cattle.
- (3.) The purification of any yard, stable, outhouse, or other place in which diseased cattle may have been confined, or over which they may have passed, and of any cart, waggon, truck, vessel, boat, or other vehicle in which they may have been carried.
- (4.) The destruction and burial of any diseased cattle.
- (5.) The destruction, disinfection, or other purification, as the case may require, of such hides, horns, hoofs, or other parts of cattle as may be suspected to have belonged to diseased cattle.
- (6.) The giving notice by owners, or others, of any contagious or infectious diseases that may affect their cattle.

Her Majesty may, from time to time, by a like Order in Council, revoke or modify any subsisting regulation, or make new regulations, in addition to, or as a substitute for, any subsisting regulation or regulations.

9. No Order in Council made under this Act shall apply to cattle affected with the diseases mentioned in the second schedule hereto.

10. *Power to declare other Diseases Contagious.*—Her Majesty may from time to time, by Order in Council, declare any disease not mentioned in the schedules hereto to be contagious or infectious, and thereupon cattle affected with such disease shall be subject to all the provisions of this part of this Act.

11. Any Order in Council made under this Act shall be valid if signed by two or more members of Her Majesty's most honourable Privy Council. The order



shall state the part of the United Kingdom to which it applies, and the time during which it is to be in force; and any person offending against any regulations made by such order shall be liable to a penalty not exceeding twenty pounds, or to such less penalty as may be stated in the order.

12. Any Order in Council made under this Act shall be published once in the "London Gazette" and twice in some newspaper or newspapers circulating in the part of the United Kingdom to which it applies, and shall not come into operation until four days at the least after its publication in the "London Gazette." A printed copy of the "London Gazette" purporting to contain a copy of any order purporting to be made in pursuance of this Act shall be *prima facie* evidence of the contents of such order.

13. A copy of every Order in Council made under this Act shall be laid before both Houses of Parliament as soon as conveniently may be after the issue of the same, if Parliament be then sitting, and if Parliament be not then sitting, then within fourteen days after the commencement of the then next session of Parliament.

14. If any person wilfully instructs or impedes or aids in obstructing or impeding any person acting under the authority of an Order in Council made in pursuance of this Act, he shall be liable, at the discretion of two Justices of the Peace, having jurisdiction in the county or place wherein such offence may be committed (who are hereby authorised and required upon complaint to them, upon oath, to take cognisance thereof, and to act summarily in the premises); to a penalty not exceeding five pounds, and in default of payment thereof, to be imprisoned for any term not exceeding two calendar months, unless the amount of the penalty be sooner discharged.

### PART III.

#### CARRIAGE OF CATTLE.

15. Every railway, canal, or other company or common carrier that carries cattle for hire within any part of the United Kingdom shall, before putting any cattle into any truck, boat, or other vehicle, cause the said truck, boat, or other vehicle to be properly cleansed, and (in cases where diseased cattle have been carried in such truck, boat, or other vehicle) to be disinfected by a washing of lime water or by some other efficient means. Any company or common carrier making default in cleansing and disinfecting any truck, boat, or other vehicle in pursuance of this section, shall be liable to a penalty not exceeding one pound in respect of each such truck or other vehicle not being a boat, and to a penalty not exceeding five pounds in respect of each boat.

16. Every railway company that carries cattle within any part of the United Kingdom shall provide at its terminal stations sufficient means for supplying the said cattle with water to drink, and shall also provide such means, at intervals of not more than one hundred miles on its railway from the terminal stations thereof, together with wharfs and pens at such intervals fit for the unloading of such cattle, and keeping them to be watered. When a railway company is by lease or otherwise in possession of another railway, and is working that other railway continuously with its own railway, the two railways shall for the purposes of this enactment be considered as one continuous railway, and the said railway company shall provide such means as aforesaid at intervals of not more than one hundred miles from the terminal stations of the railways so worked continuously. Every such railway company shall, at the request of the person in charge of the said cattle, detach at such watering places the truck in which the said cattle may be conveyed, and shall afford all reasonable facilities for the unloading, watering, and reloading the said cattle, and for forwarding them by the next convenient train. The railway company may make a reasonable charge (not exceeding twopence for each head of cattle) for so unloading, watering, and reloading. Any company acting in contravention of this section



shall incur a penalty not exceeding five shillings for each head of cattle that is not so supplied with water.

17. *Carriers may Refuse to Carry Cattle unless certified to be Sound.*—Every railway, canal, or other company or common carrier may refuse to carry and prohibit from entering on their or his premises any cattle without a certificate signed by the owner or the consignee or the person in charge of such cattle, that they are not diseased to the best of his knowledge and belief; and any such company or carrier as aforesaid may recover in a summary manner from the owner or the person in charge of any diseased cattle that they or he may have carried without knowing the fact of their being diseased, any expenses they or he may be put to in disinfecting their or his trucks, boats, or other vehicles, or otherwise may incur by reason of having carried such diseased cattle.

#### PART IV.

##### CATTLE AT MARKETS AND FAIRS.

18. *Power of Officer of Local Authority at Markets and Fairs.*—Any local authority, as hereinafter defined, may make regulations with respect to the examination of all cattle brought to or on their way to any market or fair held within their jurisdiction; and it shall be lawful for any officer appointed by such local authority, and hereinafter called a cattle-inspector, to examine the said cattle, and to exclude from the market or fair any of them that he may deem to be affected with any contagious or infectious disease, or, in the case of cattle used for human food, or with any other disease rendering them unfit for human food, and to require any cattle affected with any infectious or contagious disease to be forthwith removed to such distance from the market or fair as the cattle-inspector may think necessary for preventing the spread of infection: Any person obstructing the said cattle-inspector in performance of his duties, or refusing to comply with his orders, shall be liable, for every offence of obstruction or non-compliance, to a penalty not exceeding five pounds, and to all expenses that may have been occasioned by such obstruction or non-compliance; and all constables are required, on the request of the said cattle-inspector, to assist him in carrying into execution the powers conferred by this section. All powers conferred on the said cattle-inspector by this section shall be deemed to be in addition to any other power which he may be enabled to exercise under the other provisions of this Act, and it shall be lawful for him to take such steps as may be thought expedient for enforcing any other provisions of this Act.

19. *Definition of Local Authority.*—Subject to the exceptions and provisions hereinafter contained, the following bodies shall respectively be the local authorities to appoint cattle-inspectors, under this Act, in the districts hereinafter mentioned; (that is to say),

- (1.) In the City of London, the Court of the Lord Mayor and Aldermen of the said city:
- (2.) In the area subject to the jurisdiction of the metropolitan Board of Works, exclusive of the City of London, the metropolitan Board of Works:
- (3.) In any municipal borough in England or Ireland, the Town Council:
- (4.) In any place other than a municipal borough situate in England or Ireland, and within the jurisdiction of any trustees or improvement commissioners appointed under the provisions of any local or general Act of Parliament, or within the jurisdiction of any local Board of Health, the trustees, or commissioners, or local Board of Health:
- (5.) In any burgh or place in Scotland within the jurisdiction of any Town Council, and not subject to the jurisdiction of police commissioners or trustees, the Town Council; but in any burgh or place in Scotland within the jurisdiction of police commissioners or trustees exercising the functions of police commissioners, the police commissioners or trustees.



(6.) In any place in England, Scotland, or Ireland, not within the jurisdiction of any local authority as hereinbefore defined, the justices of the county in which the place is situate in General or Quarter Sessions assembled.

The salary of the cattle-inspector, and all expenses incurred by him in enforcing the provisions of this Act shall, except as hereinafter mentioned, be payable out of the dues, tolls, or stallages, receivable in respect of the markets or fairs of which he is appointed inspector, but in default of any such dues, tolls, or stallages, or in so far as the same are insufficient, shall, where he is appointed by the Justices of a county, be defrayed out of the county rate, or rate in the nature of a county rate leviable by them; and in cases where he is appointed by any other local authority, be defrayed out of any rate leviable by that local authority. Where dues, tolls, or stallages receivable in respect of any market or fair are the private property of any person, or otherwise appropriated by law to the private use of any person, such dues, tolls, and stallages shall not, without the consent of such person, be applicable to the payment of the salary of any inspector appointed under this section; and such salary shall thereupon be payable as in default of dues, tolls, and stallages; and when any dues, tolls, or stallages chargeable by this Act with the salary of any cattle-inspector are subject to any mortgage, all principal and interest payable in respect of such mortgage shall be fully satisfied before any payment is made on account of the salary of the cattle-inspector. For the purposes of this section, a county shall not include a county of a city or county of a town, but shall include any riding or other division of a county or liberty having a separate Commission of the Peace.

20. *Exceptions and Provisions to Powers of Local Authority.*—The following exceptions and provisions shall be made with respect to the appointment of a cattle-inspector under this Act:

(1.) No fresh appointment of a cattle-inspector, under this Act, is required to be made in any case where a cattle-inspector or other officer having power to examine cattle brought into a market or fair already exists, and in such a case the existing officer shall be deemed to be invested with all the powers of a cattle-inspector as appointed under this Act:

(2.) Where the right of holding or to receive the profits arising from holding any market or fair is vested in any body of persons or person other than a local authority as herein before defined, the power of the local authority to appoint a cattle inspector shall not arise until the said body of persons or person have or has for some period of six months made default in appointing a cattle inspector, which appointment they or he are and is hereby authorised to make.

21. All powers given by this Act to a local authority shall be deemed to be in addition to and not in derogation of any other powers conferred on that authority by Act of Parliament, law, or custom, and such local authority may exercise such other powers in the same manner as if this Act had not passed.

## PART V.

### LEGAL PROCEEDINGS AND SAVING CLAUSES.

22. *Recovery of Penalties.*—Penalties under this Act, and expenses directed to be recovered in a summary manner, may be recovered as follow:—In Scotland before the Sheriff or two Justices in manner directed by “The Railway Clauses Consolidation (Scotland) Act, 1845,” with respect to penalties imposed by that Act, the recovery of which it is not otherwise provided for. In Ireland, before two Justices in petty Sessions.

23. Gives power of appeal to Quarter Sessions.

24. Nothing in this Act contained shall affect any remedy that may be had by common law or by any other statute in respect of any act or default punishable by this Act; and it shall be lawful for any person or body of persons to

take the same proceedings at common law, or by virtue of any other statute, in respect of any such Act or default as he or they might have taken if this Act had not passed.

## PART VI.

### REPEAL OF ACTS.

25. *Repeal, &c.*—38 Geo. III. c. 65, 11 & 12 Vict. c. 107, and 16 & 17 Vict. c. 62.—Provided, that such repeal shall not affect any order in Council in force at the time of the passing of this Act, or the power to revoke the same, but such order and any regulation made thereby, shall remain in full force until duly revoked or expired by lapse of time in the same manner and with the same effect as if this Act had not passed.

*Schedule I.*—Glanders. Sheep-pox or Variola ovina. Steppe murrain.

*Schedule II.*—Pleuro-pneumonia. Scab.

---

## REPORT ON THE VACCINATION OF SHEEP—UNDER THE DIRECTION OF THE LORDS OF COUNCIL.

By JAMES F. MARSON, Esq., F.R.C.S., Resident Surgeon of the Small-pox Hospital; and Professor SIMONDS, of the Royal Veterinary College.

IN the year 1842 an Act of Parliament was passed to allow the importation of foreign cattle and sheep into England, upon the payment of 20s. per head for cattle, and 3s. per head for sheep; the importation of foreign cattle and sheep having previously been prohibited. As the numbers imported under this arrangement were found to be comparatively small, the duty in 1846 was altogether removed. The immediate effect of this free importation was, that in one year the number of sheep sent in was more than four times as many as had been during the previous three years and eight months which directly succeeded the alteration of the law.

This otherwise beneficial measure received, however, a serious drawback in 1847, when some Saxony-Merino sheep exported from Hamburg and Tönning, the chief ports of the Elbe and the Eider, brought with them a disease which, from the close resemblance in its development, progress, and effects to the small-pox of man, has been called the small-pox of sheep. The disease being of an infectious nature, subsequently spread among the English flocks, and caused serious losses to be sustained. It was confined, however, after its first introduction, for several weeks to the immediate neighbourhood of London; but by the purchase in Smithfield Market of other sheep in whose systems the disease was latent, the malady was early conveyed to many parts of the country, and chiefly into the eastern counties, through the medium of cattle-dealers.

On this visitation the disease continued its ravages for about four years, when it entirely subsided.

After an interval of 12 years it again appeared, namely, in 1862, and on this occasion it was first noticed in Wiltshire, to a small part of which county it was nearly confined, although by the sale of some lambs it subsequently extended to the county of Berkshire. It did not continue, however, for more than four months, and chiefly in consequence of the energetic measures which were adopted by the Government for its extermination.

The introduction of the disease on the latter occasion could not be traced with certainty, but it was nevertheless ascertained that it had an existence in a portion of Lauenburg and the adjacent states, from which places we had then been for some time importing sheep.

As it was positively stated by several persons that the vaccination of sheep could be beneficially employed to arrest the progress, and also, to lessen the



fatality of the malady, we undertook, at the request of the Privy Council, the task of proving the correctness or incorrectness of these opinions, and, for this purpose, we were furnished with 200 sheep by the Government. The sheep consisted of 50 Kents, 50 Exmoors and "half-breds," and 100 Cheviots. We may here remark, that we found the latter were not quite so well suited for purposes of this kind as the others, in consequence of so many of them having so much hair on the inner side of the thighs, the part generally selected for inoculation or vaccination, as being the least covered with wool or hair.

The sheep were at first branded on each side in consecutive numbers from 1 to 200, and for the better carrying out of the experiments, they were divided into lots of 50. The numbers were entered in a book, and against each sheep a record was kept of the effects produced from time to time by the several experiments to which the animals were subjected.

On the 24th of October 1862, the vaccinations were commenced, and, by the 14th of November, the whole of the sheep had been vaccinated once over, six punctures being made in each case. Current vaccine lymph, obtained from three different sources, was used, Jennerian, that in use at the Small-pox and Vaccination Hospital, and some which had been originally procured by Mr Badcock a few years before from inoculating the cow with the virus of human small-pox. No essential difference, however, was observed in the local action produced by these respective lymphs, either on this or any subsequent vaccination of the animals.

In the course of a few weeks we had had ample opportunities of satisfying ourselves of the comparative insusceptibility of sheep to the vaccine disease; for on the first vaccination being completed, it was found that, out of the 200, effect had only been produced on seventy-one of the animals. This fact determined us to procure if possible some *primary* vaccine lymph from the cow, and for this purpose advertisements were inserted in the "*Veterinarian*."

A small supply was obtained from three individuals, which, however, on trial proved to be quite inert. It is right that we should state that we had great doubt as to whether any of this was true cow-pox lymph, arising from the circumstance that there is a greater difficulty in obtaining genuine lymph from the cow than is generally supposed, and chiefly from the very rare occurrence of late years of the disease among these animals, as also from their being subject to other eruptive diseases which are liable to be mistaken for the true cow-pox.

For the purpose also of endeavouring to obtain primary lymph, recourse was had to the inoculation of cows with the virus of human small-pox, a proceeding that has been occasionally resorted to with success. Seventy-two animals were inoculated between the beginning of November and the end of August of the following year, 50 of which were tried two or three times in succession. We were enabled, however, to charge only a few points from the whole of these inoculations, and the material thus obtained, when used on sheep, was found to have no greater effect than that produced by current vaccine lymph.

We next resorted to the vaccination of some calves, with the view of obtaining, if possible, a supply of lymph on the so-called principle of retro-vaccination, namely, the passing of current vaccine lymph through a bovine animal. A scanty supply was thus procured, which, however, on trial was likewise found to be not more active than ordinary vaccine lymph. This point we shall have occasion hereafter to refer to again.

Finding such unsatisfactory results from these experiments, we determined to *ovinate* the cow, with a view of procuring, if possible, a lymph which would produce more decided action on the sheep on being returned to this animal, in a similar manner that the virus of human small-pox, after being passed through the cow, has been returned to man. For this purpose six cows were ovinated with lymph taken from a natural case of sheep-pox, eight punctures being made



in the *perineum* or on the *labia pudendi* of each cow. No special results followed, but some of the same lymph, used at the same time on sheep, took readily. The experiments were repeated on these cows shortly afterwards with a like result. Within a few weeks of this time five other cows, a heifer, and a steer, were ovinated after the same manner from a natural case of sheep-pox, sets of scratches being used as well as punctures on the teats and other parts; but still no sufficient effect was produced to enable us to obtain lymph. These experiments, as far as they go, show the correctness of that which has been stated by several of the continental writers respecting the insusceptibility of the cow to take the sheep-pox, and they also confirm the experiments which were instituted by ourselves in 1848, to determine this same question.

Although scarcely anticipating any greater success, we nevertheless resolved to give trial to the vaccination of pigs, and also to the inoculation of them with the virus of human small-pox; these animals being omnivorous, and therefore, like man, living on a mixed animal and vegetable diet. Pigs varying in age from a few weeks to a year old were chosen for the purpose. The vaccinations, although several times repeated, produced no effect, and the inoculations but very slight; no vesication following from either.

We were thus thrown back upon current vaccine lymph for the completion of the experiments, and after a short interval the sheep not affected by any of the previous vaccinations were vaccinated again, but without any material alteration in the results being obtained. Fifty-six sheep were next selected for a repetition of the experiments, care being taken that some of them should be animals on which a former vaccination had had effect. Only 12 of the 56 sheep showed any result from the operation; and it is worthy of note that no less than eight of these, or two-thirds, had been affected before. Another 50 were selected and vaccinated, and 29 of them took the disease; 17 of which, or nearly two-thirds again, had been influenced by a previous vaccination. The second action of the vaccine virus was found to be fully equal to the first, by which it appeared to be in no way influenced.

The fact of sheep being susceptible to the action of the vaccine virus a second and even a third time, as we proved by oft repeated experiments, is of itself sufficient to show the inutility of the vaccination of sheep. For if the first vaccination affected the system so as to be protective, the animal would not be susceptible to a second action of the same virus, until after a lapse of probably some years, instead of being acted upon by it a second time, almost immediately.

A slight difference only was observed in the action of the Jennerian, and Small-pox and Vaccination Hospital lymph, the two which were principally employed; 33 per cent. only of the whole of the vaccinations with Jennerian, and 38 per cent. of those done with the Small-pox and Vaccination Hospital lymph showing results.

The vaccine disease in the sheep, even when developed to its fullest extent, is very unlike the same disease in the human subject. In the sheep it is but seldom anything more than the production of a small papule, which occasionally results in the formation of a minute vesicle, or more commonly a pustule, which is sometimes, although very rarely, surrounded with a slight areola. Generally, however, neither vesication nor pustulation follows, but a small scab is produced, which soon falls from the site of the puncture, leaving no trace behind. The disease passes quickly and irregularly through its several stages, so as to have ended by the eighth or ninth day, or not unfrequently even before this time. Lymph is but rarely obtainable, and never but in the smallest quantity, and this on the fifth or sixth day succeeding the vaccination. The effects are only local, and the animal's health never impaired. In man, on the contrary, vaccination can nearly always be made to take effect, a vesicle being formed on the eighth day, affording regularly lymph for the vaccination of others, which is always, or nearly always, followed by areola, the vesicles being never so small as those observed in sheep,



excepting in what are called abortive or spurious cases, which, however, in well-conducted vaccinations, are of very rare occurrence.

Our observations, therefore, fully confirm the remarks of Mr Ceely, of Aylesbury, who says, "That imperfect development and premature decline, with little or no areola, is the rule" in the vaccination of sheep.

Besides the 200 ewes, two rams were vaccinated. In one ram, effects rather greater than those usually observed were produced in four of the punctures, and in two of them in the other ram. Both these animals were subsequently ovinated and contracted the sheep-pox, passing regularly through its several stages. Both recovered. Six lambs were also selected for vaccination, four of which were operated on with Small-pox Hospital lymph, and two with primary lymph. The Small-pox Hospital lymph took effect in all four animals, but the primary lymph failed in each case. The six lambs were also ovinated with success, and all recovered. No difference in the course of the disease produced by the ovinations being observed between those in which the vaccination took effect and those in which it failed.

Besides the preceding instances of ovination after successful vaccination, 25 sheep, which had also been successfully vaccinated, were ovinated, and contracted the disease. Two of these animals died; and it is especially worthy of comment that both of them had shown effect *twice* from vaccination, thus proving the non-protective power of even a double effective vaccination.

Sixteen sheep which had been vaccinated with success were exposed to the sheep-pox and took it naturally; and out of this number no less than eleven died, thus proving that the severity of the disease was in no way mitigated by the vaccination.

Our experience of the vaccination of sheep therefore agrees with that of Hurtrel D'Arboval, who gives the following details:—"1523 sheep," he says, "were subjected to the operation of vaccination, and of these, 1341 contracted the vaccine disease, and 182 were not affected. Out of the 1341 sheep, 429 were subsequently exposed to sheep-pox, either by direct ovination or by being placed among infected animals, and 308 of them were attacked with the malady." Hurtrel D'Arboval infers that the escape of the remaining 121 sheep was probably to be attributed to either their non-susceptibility or to some defects in conducting the experiments; and he concludes that "vaccination cannot be substituted for ovination."\*

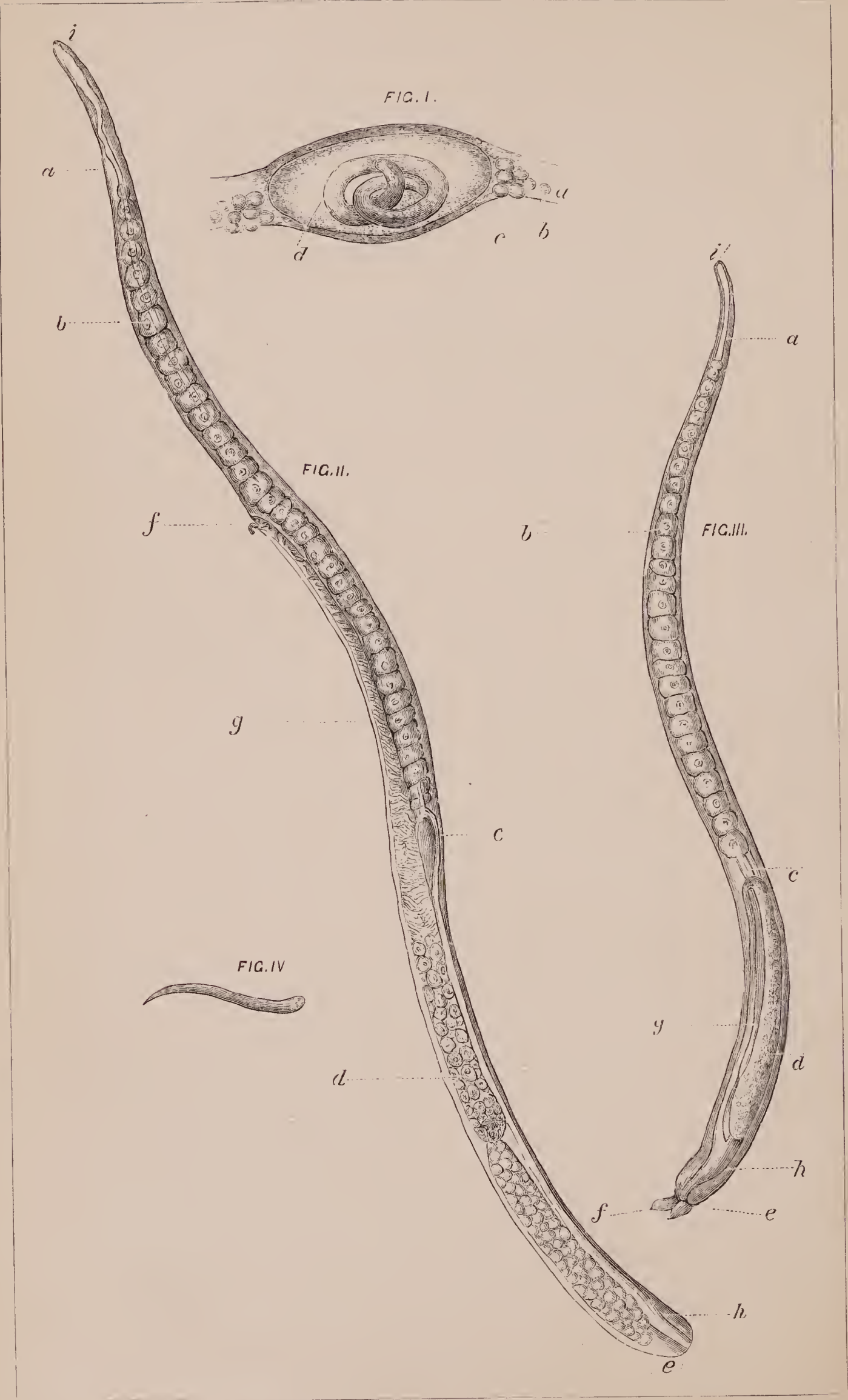
---

\* Dictionnaire de Médecine Vétérinaires.—Art. *Clavelée*.

(*To be continued.*)







TRICHINA SPIRALIS.

# EDINBURGH VETERINARY REVIEW

AND

## Annals of Comparative Pathology.

---

### ORIGINAL COMMUNICATIONS AND CASES.

---

*On Trichina Spiralis.* By Professor FURSTENBERG, of Eldena.

IN recent times, a peculiar parasitic disease of man has been discovered, and has given rise to numerous investigations. This is the so-called "Trichinous disease." The first to establish the fact of the existence of this disease in man was Dr Zenker, of Dresden. In 1860, a girl from the village of Planen, near Dresden, was brought into the hospital superintended by Dr Zenker, suffering from what appeared to be an attack of typhus. She died a few days after. Zenker was at this time investigating the changes which the muscular fibres underwent as a consequence of typhus; and, on examining the muscles of this girl, he found in them a large quantity of *Trichinæ*. He immediately instituted an inquiry, which resulted in the discovery that trichinous pork had caused the disease, the girl having eaten some of this in the raw condition while making sausages. It farther appeared that, besides the girl, several other members of the family, and the butcher who had killed the animal and made the sausages, had taken the trichinous disease.

This first case once established with certainty, the attention of physicians was more particularly directed to the disease, and very soon cases were announced from different places in Middle Germany. In some towns they were so numerous that the disease was looked upon as an epidemic. In October 1863, 153 persons were attacked by the disease in Hellstadt, of whom twenty died. There also occurred cases more or less numerous in Magdeburg, Guedlinburg, Erfurt, Planen in Voigtland, Kalbe on the Saale, &c. Experiments were undertaken with the flesh of the girl who had been under Dr Zenker's care, for the purpose of determining the circumstances under which the trichinous disease is developed. Before the occurrence of Dr Zenker's case, however, Professor Leuckart, of Giessen, had made the experiment of feeding a pig with trichinous human



flesh, in order to observe the trichina of muscle, and the disease brought on by the entrance of trichinæ into the muscular fibres of swine. The trichinous disease has accordingly been only correctly observed and understood since 1860.

Trichinæ had, however, been known for a much longer time. They were first discovered by J. Hilton, in the muscles of the chest of a man who died of cancer in Guy's Hospital, London, at the advanced age of seventy. In 1835, Paget handed to the celebrated naturalist, Owen, a portion of flesh taken from a person who had died at St Bartholomew's Hospital, and which contained numerous white capsulated trichinæ. It was Owen who gave the name *Trichina*; and, from the coiled appearance of the worm in the capsule, he called it the *Trichina spiralis*.

In 1835-36, many cases of human bodies infested with trichinæ were reported—one party, Harrison, reporting five or six cases. But in Germany, also, trichinæ had already been found in human bodies when Owen published his observations. Thus Henle, in 1834, while dissector in the Anatomical Hospital at Berlin, made some observations on the trichinæ capsules and the worm they contain. A. Farre closely examined the structure of the trichina, and published his observations in the "Medical Gazette" in 1835. Bischoff was able to confirm Farre's description after seeing a case which occurred in a human body in Heidelberg in 1838. In the same year Gurlt observed the disease in the muscles of the eye of a cat, and communicated the fact to me verbally at the time it happened. This is the first instance of the disease having been observed in the lower animals. Afterwards communications on trichinæ were made by Vogel, Zuschka, Dujardin, and Siebold—the two last of whom considered the trichina as a Nematode worm in an early stage of its existence, and undergoing development. Henle had already taken the same view of the malady. Herbst made experiments in 1851 with the flesh of a badger which contained a great many trichinæ. He administered this to three dogs, and three months after found the muscles filled with trichinæ. Meissner, in 1855, declared the trichina to be larva of the Trichosoma, and Küchenmeister considered it the larva of the Trichocephalus. At the same time Bristowe and Rainey wrote a treatise on these animals. In 1858, Leuckart received from Professor Nasse, of Marburg, trichinous flesh, gave it to a pig, and killed it four weeks after, when he found a quantity of trichocephali, which, however, almost always exist in swine. This made him take the trichina for the larva of the trichocephalus. Virchow had, in 1859, fed a dog with flesh containing trichinæ, and, having killed it four days after, he found in the ilium a great many worms, sexually ripe and which he was inclined to consider as the trichonocephalus at a certain stage of its development. He came to no decisive conclusion, however, on account of the dissimilarity of the ova.

Leidy, in America, was perhaps the first who observed trichinæ in swine; so that, in 1860, when the trichina disease in human beings was discovered by Zeuker, the *Trichina spiralis* had already been found not only in man, but also cats, badgers, moles, and swine.

In the year 1860, investigations into the development and migration of the trichinæ were carried on with the greatest activity. Leuckart had, independently of Zenker, fed dogs and swine with trichinous human flesh, which he obtained from Professor Welker, of Halle, in January 1860, and obtained results similar to those found by Virchow—namely, trichinæ, sexually ripe, in the intestines. With these sexually ripe intestinal trichinæ he fed a pig, and afterwards found large numbers of trichinæ in its muscles.

About this time investigations were commenced, whereby it was hoped that some prophylactic measures might be discovered which would prevent the entrance of the trichinæ into the human body, and by which the trichinous disease might be prevented in man. Experiments on this subject were first made by Leisering and Haubner in Dresden. Besides inquiring into the symptoms shown by animals after the reception and migration of the trichinæ, and into the development of the trichinæ themselves, experiments were made with trichinous pork, in order to determine what would destroy the vitality of the trichinæ, or neutralise their effects. These experiments have been continued to the present day. Similar experiments were made in the hospital at Dresden by Dr Fiedler, by Küchenmeister in Dresden, and by myself in Eldena, the results of which will be stated hereafter.

As all Nematodes have to go through two stages of development, so also has the *Trichinæ spiralis*. We find them sexually undeveloped, and while waiting for their deliverance, contained in capsules lodged in the muscular fibres of man and animals, or if they have reached the stomach of an individual, divested of their capsules by the gastric juice, and lying free on the inner surface of the digestive organs in a sexually ripe condition. In accordance with these two stages of development, trichinæ have been divided into muscle and intestinal trichinæ.

The muscle trichinæ, as already said, were first observed in human muscle. A short time after their migration into the muscle, they are found in longish, round, oval, or lemon-shaped capsules, in which they are for the most part coiled up in a spiral form. The capsule which encloses the worm is more or less thickened according to its age. When the trichinæ have been already a long time in the muscles, salts of lime are deposited in the interior of the capsules, rendering them whiter and more easily observed. The accumulation of these calcareous salts is sometimes so great that the contained parasite is not observable,



and can only be seen wound up in a spiral manner when the earthy salts have been removed by hydrochloric acid. The precise time at which such calcification occurs has not yet been made out. In no case have I found it to have taken place in the capsules contained in the muscles of swine and rabbits, even though a full year may have elapsed since the trichinæ entered them. Several years' residence of the trichinæ in the muscles is therefore required, in order that the capsules may become calcified. After the lapse of a number of years the worm perishes, and its body undergoes a fatty metamorphosis, so that we can then find only lime and fat molecules contained in the cysts.

The long diameter of the completely-developed capsule varies from 0·2815 to 0·5 millimetre—the short diameter (breadth and thickness) between 0·2125 and 0·2635 millimetre.

In the cut the trichina with its capsule is portrayed as I found it in the flesh of a pig which had been fed nine months previously with trichinous flesh. In human bodies in which they have been found accidentally, the cysts are easily seen with the naked eye in consequence of the earthy salts deposited in their interior. They appear as white points about the size of a grain of sand, an appearance which has not yet been seen in any animal, however many capsulated muscle trichinæ it may have contained. Their absence may be accounted for by the fact that animals killed for human food are killed too young to have allowed time for the capsules to undergo the calcifying process. In our domestic animals, accordingly, these worms cannot be recognised without the aid of a microscope. If these capsulated trichinæ are swallowed in a living state by any one, as in raw meat or other food containing them, the capsules are dissolved by the digestive process, the contained trichinæ are liberated, and in a very short time they attain their full size and full sexual development. This will often be completed in twenty-four or thirty-six hours after such meat has been taken, the growth of the worm being greatly favoured by the abundant nourishment which it finds in the stomach. The different sexes are easily distinguished.

The females (fig. 2) are larger than the males, varying from 1·8 to 2·5 millimetres in length, and, on an average, 0·06 millimetre in breadth. After four or five days they perform coitus, and their ova, with embryos, may be seen in the oviduct, and free embryos close the vulva, from which they creep forth on the sixth or eighth day.

The males (fig. 3), which in their fully-developed condition have an average length of from 1·5 to 1·8 millimetre, and are therefore smaller than the females, can be more easily distinguished from the latter by the peculiar form of the hind part of their bodies than by their size. The fore part of the body in both sexes is pointed, and has a diameter of 0·006 to 0·008 milli-

metre. The hind part of the body of the female is round, and its diameter is a very little greater than that of the middle of the body. It contains the anus. On the border of the third part of the body, at its anterior portion, is an opening, the vulva through which the young make their exit from the oviduct. In the anterior portion of the body is a delicate canal which a little more posteriorly is surrounded by a beaded-like body, containing minute cells, and this is continued as far as the stomach in the posterior part of the worm. The stomach extends almost to the posterior extremity of the body, but a little in front of the anus terminates in a short intestine. By the side of the stomach lies the ovarium from which the oviduct extends almost to the posterior extremity of the body, and bending forward is continued to the vulva.

Whilst the anterior part of the male scarcely differs from that of the female, the posterior extremity is distinguished by two conical projections. Between these projections is an orifice representing at once the anus and the opening of the generative organs. The œsophagus and the cellular body surrounding it extends in the males as far as the commencement of the posterior third, and then terminates in the stomach, which does not extend so far back as in the females. It ends in a rectum, provided with a thin wall, and continued to the anus. The male generative organs consist of a single testicle lodged beside the stomach, and extending from its posterior to its anterior extremity, when it bends upon itself, and terminates in a canal of much smaller dimensions, and which in its turn opens into the rectum a short distance in front of the anus. The drawing will sufficiently illustrate this.

It has been already remarked that the trichinæ, as soon as they have entered the intestine, and undergone a sufficient degree of development, copulate, and from six to eight days later bring forth embryos. These (fig. 2), are on an average from 0·012 to 0·015 millimetre long and 0·0056 millimetre broad. They are very eager to gain their future dwelling-place, and accordingly soon pierce the coats of the bowels to reach the abdominal cavity, whence many enter the muscles, whilst others first pass into the thorax, and thence into the surrounding muscles.

We therefore always find the greatest number of these trichinæ in the muscles which lie nearest to these cavities, as in the diaphragm, the abdominal muscles, and the psoæ. In the cervical and cephalic muscles, including even those of the ear, the trichina capsules have been found. Likewise in the tongue and in the laryngeal and pharyngeal muscles they are met with. They have been seen in the œsophagus as far back as the striated muscular fibres extend, in the pig, for example, to within an inch of the stomach. They are further very common in the muscles of the upper part of the fore extremities and in the middle of the



hind ones; but I have found them less plentifully in the longissimus dorsi.

After the embryos have entered the muscular fibres they are at first stretched out; in a short time they assume a bent position, and afterward, when they have completed their size, they are coiled up in a spiral manner. Changes take place in the muscular fibres, consequent on the presence of the trichinæ upon them, and in their interior (*an und in derselben*). The fibrillæ by and by perish; the muscular fibres lose their striated appearance; the contents consist of small molecules, apparently the sarcous elements lying loosely together, and amongst these the worm moves. When the trichina has located itself in a fibre, the latter widens at this point, becoming constricted at each end, so that it forms an ovoid dilatation, in which the true cyst, containing the worm, is gradually developed. In from four to six weeks after feeding with trichinous flesh, the worms are found to be already encysted. By this time the sexes are easily distinguished. The males are marked by the course of the digestive track, and the limitation of the sexual apparatus to the hind part of the body. They also exhibit in this end a channel running transversely, so as to divide this extremity into an upper and a lower portion.

The tenacity of life in these muscle-trichinæ is very great. I have found them still alive in moist decomposing flesh so long as eight and even ten weeks after the decease of the animal.

Experiments made to ascertain the duration of life of these muscle-trichinæ in flesh used as human food, were first made by Leisering and Haubner. Afterward, Dr Fiedler, in Dresden, and myself in Eldena, made other experiments, of which the following were the results:—

The only animal used as human food, and which has been shown to be attacked by trichinæ, and to have caused trichinous disease in man, is the pig. This disease has resulted from the eating of trichinous pork, not only in the raw state, but also after it has been dressed or prepared. In all cases, an essential condition is, that the flesh should be full of trichinæ, as a small number of these worms, taken into the system, will not develop the malady.

The food that has especially led to the transference of these entozoa into the human body has been sausages prepared of hacked or chopped raw flesh, spiced and slightly salted; particularly dangerous are the so-called *Brattwürste*—German pork sausage—which, before being eaten, is subjected only to a heat sufficient to swell the superficial portion and render the skin tense. Prepared thus, the interior of the sausage remains quite raw, as its temperature is usually never raised above 25° Reau., a degree of heat not at all injurious to the trichinæ. This kind of animal food (*würste*) is taken in considerable quantities in central Germany,

as in Saxony, where it is a favourite dish of the inhabitants. Working people in these countries often eat pork and onions laid on bread in a kind of raw condition. Another kind of sausage is the so-called *Schlag* or *Mettwurst*, made of raw, chopped flesh, with pepper, salt, &c., and slightly smoked after being filled. If the flesh contains many trichinæ, it will cause trichinous disease when eaten, even after having been smoked for three or four days.

Raw trichinous ham also has caused the disease in cases where, to preserve it juicy and palatable, it has been only slightly pickled or salted and smoked but for a short time. This mode of pickling, which fails to kill the trichinæ, is particularly resorted to by butchers who must secure quick returns.

Further, the trichinæ can be carried into the system by flesh containing them, when this is used in the form of steaks or other roasts, and is not thoroughly done, but left rather raw in the centre. The heat in this part is not raised sufficiently high to kill the trichinæ. Steaks, above all, are liable to convey the trichinæ in this way, when only exposed a short time to the fire.

The so-called *Wellfleisch*, used in making blood-puddings and other sausages, though boiled, is only kept in the boiling-water for a short time, and still contains living trichinæ if the pieces are too large, and if the temperature requisite to destroy the worm has not existed throughout the pieces. Experiment has shown that such sausages will produce trichinous disease in individuals partaking of them.

Trichinæ are with certainty killed by a temperature exceeding 55° Reau. (156 Fahr.), so that the safest method of destroying them, and rendering them harmless, is to thoroughly boil or roast the flesh, insuring that it is sufficiently done within as well as on the outside.

Further, the investigations of Leisering, Haubner, and Fiedler, have shown that the withdrawal of the moisture causes the death of the trichinæ. Thus Fiedler found that flesh containing a great many trichinæ proved comparatively harmless after it was dried.

My own experiments, which are now in part concluded, show that every process by which water is withdrawn from the flesh results in the destruction of the trichinæ.

When flesh is cured without being moistened, as by putting a sufficiency of salt upon it in a proper vessel, the salt withdraws water from the flesh, and forms a brine. The trichinæ are killed in eight or ten days by this process, as has been fully proved by experiments with flesh cured in this way. The trichinæ, in this case, appear to be shrunk, and the brownish pearl-string-like body surrounding the œsophagus is no longer to be seen. If put in water they resume their original size, but the yellowish-brown colour of the internal organs is lost.



If the so-called *Schlag* or *Mettwurst* is properly salted, seasoned with pepper and other agents, dried for two or three days after preparation, and then smoked, or, as is done by butchers, rubbed with pyroligneous acid, it contains no more living trichinæ, as my experiments have shown, provided it has been smoked, or rubbed with pyroligneous acid eight days before being used. In this also, as in pickled flesh, the trichinæ appear shrunk.

After the preparation of bacon and hams in England, where they are dried after having been pickled with salt, there should be no living trichinæ, although the flesh may have contained them previously.

Finally, my experiments have shown that swine may have a considerable quantity of trichinæ in them, without having shown any symptoms of disease during the migration of the worms into their muscles. The same is the case with rabbits, so that in neither animal can the presence of the worm be recognised during life, and can only be satisfactorily determined after death, by a microscopical investigation.

The muscles mostly inhabited by the trichinæ are those of the head, tongue, larynx, pharynx, fore extremities, and, above all, the diaphragm, with the pectoral, abdominal, and psoæ muscles. The longissimus dorsi and gluteal muscles contain fewer of the parasites as a rule. Other muscles also contain trichinæ, either singly or in groups.

*Worms and Fibrinous Concretions in the Blood-vessels of Horses and Colts.* By I. SEAMAN, Veterinary Surgeon, Safron Waldon.

CASES similar to those which I beg to offer you for publication have either been of rare occurrence, or, having occurred, have escaped the notice of veterinary surgeons. When making *post-mortem* examinations, I have consulted many eminent medical men on the subject; and although some have discovered fibrinous concretions in the heart and large blood-vessels, and admit it as a disease of blood disorganisation, have not observed the entozoa which have been noticed by me. Mr Webb, a neighbouring veterinary surgeon, has mentioned to me cases of colts that have died under very extraordinary circumstances, the carcasses of which he examined, and found the omentum and peritoneum in precisely the same condition as they were found in my cases; and I have no doubt if he had dissected his subjects more minutely, he would have found parasites in the mesenteric artery and fibrinous concretions in the heart and large blood-vessels.

CASE 1.—An agricultural colt, aged eight months, had been grazing upon pasture during the day, lodged in an open shed and yard at

night, and fed upon chaff and oats; it had not been noticed ill, but was found dead in the morning.

*Morbid Appearances.*—Body much swelled, peritoneum reddish-brown, bowels greatly distended with gas, the entire mucous membrane of the intestines much thickened, and reddish-brown and black in patches, mesenteric veins gorged with black blood, omentum sooty black. The mesenteric artery, and about two inches of its three principal branches, were found to be obstructed by worms and abnormal fibrin, and the walls of the vessels contiguous to obstruction partly ossified, and even greatly congested.

*Chest.*—Lungs dark-brown colour, bronchia filled with frothy mucus. The right side of the heart filled with black, thin blood. The left side of the heart contained a fibrous concretion, which, with its elongations into the aorta and cardiac artery, weighed about three ounces.

CASE 2. A nag colt, aged 14 months, which I had an order to castrate, was found dead on the morning the operation was to have been performed. The colt had not been noticed ill previously.

*Morbid Appearances.*—Belly much swollen, peritoneum reddish brown, omentum almost black, spleen gorged with black, thin blood, mesenteric veins stuffed full of blood, mucous membrane much thickened, dark in colour, and black ecchymosed patches variously disposed upon its entire surface. A tumour of similar composition (worms, altered fibrin, bony matter) obstructed the mesenteric artery and its principal branches for a short distance.

*Chest.*—Lungs gorged with unhealthy blood; the left ventricular and thoracic aorta were occupied by a large piece of fibrin. It must be understood that no red corpuscles were mixed with these fibrinous concretions.

CASE 3. An agricultural horse, aged 12 years, during two months was frequently griped, walked stiffly with the hind legs, the coat stared, the skin tight upon the ribs, and the appetite morbid and irregular; died greatly emaciated.

*Morbid Appearances.*—Omentum very dark in colour, and adhered to the adjoining peritoneum. The entire surface of the peritoneum was hung in shreds. Many of the mesenteric veins appeared to have been long obliterated, for they were more like tendons or ligaments. There were many ulcers upon the mucous surface of the bowels. The liver was found firmly connected to the diaphragm. The entozoa, ossification, and obstruction of the mesenteric artery were in this as in the preceding cases; but in addition, about two inches of the aorta anterior and posterior to the mesenteric branch was ossified, and at the arch of the aorta there was a small concretion of fibrin, bony matter, and a few entozoa; lungs gorged with thin, dark-coloured blood, and walls of the right ventricle of the heart greatly attenuated.



A large fibrinous concretion was found in the left ventricle firmly interlacing the cordæ tendineæ, and depriving the mitral valves of their power of preventing the return of blood into the auricle, it ascended the aorta, firmly uniting with the semilunar valves, then dividing, sending branches to the anterior and posterior aorta, right and left carotid and thoracic arteries. This concretion also occupied the left auricle, interlacing the muscoli pectinati, and sent off branches which penetrated the pulmonary veins six inches in length.

CASE 4.—An agricultural colt, 15 months old, had been castrated. The wounds progressed favourably; was attacked with lock-jaw three weeks after the operation, and died.

*Morbid Appearances.*—Peritoneum (omentum black as usual), mesenteric veins, mesenteric artery, with its branches, and the fibrinous concretions in the left side of the heart, were in the same morbid condition as were the similar parts in the preceding cases.

CASE 5.—An agricultural colt, six months old, appeared griped, chose to be alone, frequently lay down, moved sluggishly and weakly, and the head lowered almost to the ground. It continued in this state a week and died.

*Morbid Appearances.*—The peritoneum and its entire reflections highly congested. The omentum black, mesenteric veins gorged with blood. There were worms in the mesenteric artery, and the walls of the vessel were ossified. The left side of the heart was occupied by a fibrinous concretion, and the lungs were highly congested.

CASE 6.—An agricultural colt, 14 months old, had been castrated, and was fast recovering. It suffered with griping pains seven days and died. The colt appeared frequently in urinating attitude, a symptom always present in peritonitis.

The only differences in the morbid appearances of this and the preceding case were—beside the general inflammation in which the peritoneum was involved—a large mesenteric abscess and adhesion of the rectum and colon. This colt belonged to the same owner as case 4.

CASE 7.—An agricultural colt, two years old, had been castrated a fortnight, was progressing favourably, had griping pains, walked stiffly, dragging the hind legs, appeared very dull and weak, grunted painfully at intervals; evinced great pain on pressure of the hand over the lower extremities of the ribs; and the walls of the abdomen appeared very tight. The head was frequently turned towards the right flank. The mouth gave a smell of rotten bones; the maxillary artery full, the pulse dwelling upon the finger, and there was a wild, anxious countenance. Diagnosis, peritonitis with acute indigestion.

*Treatment.*—Ol. Lini. Ojss Ung. Canthar to lower part of belly; Aloes Socot., Gum, Myrrh, Pil. Hydr., Hyoscyami Ext. aa ʒss

twice a-day; at the end of two days, improvement, and the medicine was discontinued. A fortnight afterwards the colt had a similar attack, was treated the same, and the acute symptoms yielded as on the first occasion. The colt continued to be affected in the above manner at intervals during two months, when it died suddenly; that is, it dropped and died without a struggle. I now diagnosed the case.

*Morbid Appearances.*—Body greatly emaciated. The cavity of the abdomen presented a most astonishing scene. The omentum was not the usual beautifully organised piece of network; its vessels appeared to have been long obliterated, and had formed themselves into ligaments which interlaced each other, and firmly braced together the stomach, bowels, and bladder to the peritoneal lining of the abdomen. These ligamentous bands were of a sooty-black colour, and very tough and twiny. There were a number of ulcers upon the mucous surface of the bowels, one of the duodenum perforated all its coats. The mesenteric artery, and a short distance of its three principal branches, were obliterated and ossified, and about two inches of the floor of the aorta, immediately anterior to the mesenteric artery, were ossified and partially obliterated, lungs dark colour, and greatly disorganised, and there was a large fibrinous concretion in the left side of the heart, which sent off branches penetrating the pulmonary veins.

CASE 8.—An agricultural colt, nine months old, had acute griping pains, sweated profusely, looked wild, the body excessively tympanitic, died twelve hours after the attack, had not been noticed previously ill. Carcass examined two hours after death; peritoneum and omentum only slightly congested; walls of all the small bowels black in colour; mucous membrane very much congested, giving the inner surface of the bowels a thick, black, jelly-like appearance; profuse hæmorrhage of thin reddish-brown blood had taken place into the small bowels; the cæcum congested; the mucous membrane at its apex highly so.

The vena porta in this case was obliterated, and in this and its hepatic branches I found more worms than in any of the preceding cases. The mesenteric and other arteries were free from parasites. A large fibrinous clot was found in the left side of the heart, and the lungs extensively congested.

CASE 9.—An agricultural colt, two years old, had been a week castrated, had gripes at morning, and died during the first night of its illness. About four gallons of reddish serum were found in the abdomen; the peritoneum highly congested; the large bowels dark-brown colour; the mesenteric veins very full of blood; the mesenteric artery was obliterated, ossified, and contained entozoa; the aorta just above the mesenteric branch was ossified; a fibrinous concretion was found in the left ventricle of the heart, firmly interlacing the cordæ tendineæ, it extended into the left auricle interlacing the muscoli pectinati, dividing and sending off



branches which penetrated the pulmonary veins. Ossification had commenced at the arch of the aorta, where there was a small spoiled fibrin-like concretion.

In offering these cases for publication, I may remark that, whilst they possess a most uncommon degree of scientific interest, they are no less interesting to the veterinarian in a practical point of view. It is for the physio-pathologist to determine by what means worm parasites find their way to the interior of bloodvessels, and which of the three—worm, ossification, or concretion—first attacks the bloodvessel. Congestion of the lungs, peritoneum, mesenteric veins, and mucous membrane of the bowels, do not appear difficult to account for. And the acute symptoms, as they appeared immediately after castration, may be accounted for from the fact, that colts are generally very wild at the time of being caught for the operation, they get frightened, exert themselves very much, and sweat profusely. The action of the heart and bloodvessels is increased, and the blood is propelled with greater force into the capillaries. From the previous partial obstruction of the mesenteric artery, a fibrinous concretion most probably has already been formed in the heart, which, from the increased agitation of the blood during the struggling of the colt, increases rapidly in size, which subsequently prevents the return of venous blood to the lungs, for they are in a congested state in consequence of the pulmonary veins not being able to deliver their contents through the left side of the heart, and hence the highly congested state of the mesenteric and peritoneal bloodvessels. I could have wished that a more scientific pen than mine had taken up this most important subject, but it is to be hoped that, now that the subject is introduced, it may receive its justly merited share of discussion.

---

*Extraction of a Foal with the Head Back.* By W. A. CARTWRIGHT,  
M.R.C.V.S., Whitchurch, Salop.

I SEND you the following case as another instance of the difficulty there is in extracting the foal with the head back.

About eight o'clock on Saturday morning, the 14th May 1864, I was called in to attend an aged large grey cart mare, that could not foal, the property of Mr Edward Tudman, liquor-merchant, of this town.

It appears that some people belonging to the railway, close by the field where she was in, had seen her wandering about the field at a very early period of the morning, as if wanting to foal, and no doubt such had been the case.

We took her up out of the field, and put her into a good, roomy place, in some building, when we discovered that the foal's fore-feet

were protruding through the vulva (one more than the other), and portions of the placenta were hanging around, but there was no appearance of the head. I now introduced my hand, but could not detect the head anywhere, though I suspected it lay doubled back by the side of its shoulder and side, on the right side of the mare. At other times we thought it lay down in the left flank of the mare, as we could feel externally a hard substance there, but of this we were not certain, whether it was the head or stifle. In consequence of the mare getting very unruly we could not make the necessary explorations, when we determined on bringing her out into the field and casting her with the hobbles, which we accordingly did ; but even now, after a long and most painstaking and difficult trial, my son and I could not succeed in reaching any part of the head, though we *thought* we could just feel the back part of the neck, and into this place I got a hook but with no avail, as I could not get the head, if it was it, any nearer. I then determined on taking one of the fore-legs away, and after making an incision all along the limb as high up towards the shoulder as I could, and separating the skin, we tried to pull it away, but we were very much disappointed at it separating at the shoulder joint, and this I am inclined to think was in consequence of the skin not being sufficiently slit open high enough so as to admit of the thick part of the shoulder passing through. I never had one which came off at the shoulder joint before. My son and I again made another exploration for the head, but without avail. We then had the other fore-leg drawn forward, thinking it would remove the head, or draw it more towards us, but this also was useless. We now scarcely knew what to do, and as I scarcely ever had occasion to remove both fore-legs to get the head up, I did not feel much inclined to do so now. But then what was to be done? After thinking the matter over awhile, I determined to remove the other leg. This time I was more careful in nicking the skin higher up, and separating it from the cellular membrane surrounding the leg. I also cut the leg off at the fetlock joint, leaving the foot attached to the skin to pull at after the leg was away. Having done so, we attached our cords to the leg just above the fetlock joint, and pulled the limb away without using more than the usual force.

Even now we could not discover the head. We got hold of the flaps of the skin that had surrounded the fore-legs, and drew at them to get the other part of the foetus forward. I then slit open the breast into the chest, and my son drew out the contents of the thorax and abdomen ; by so doing I thought the head would lie against the side of the chest or abdomen, and so come pretty easily out in its doubled state, as the only chance left us in removing it. We again pulled at the skin that had covered the legs, and determined upon a final effort, when we soon found that we were gaining ground, and that the foal was



coming out with the head doubled back. When the tip of the head was appearing I inserted hooks into it, and then by a few steady pulls it came out in its doubled state without our using any great force, or doing much harm ; and soon after we drew the remaining part of the body out. When we were last pulling, and the mare violently straining, we distinctly heard some smack or snap, as if the back bone was broken, or something had given way or was fractured.

When the fore parts were coming away, the leg that had separated at the shoulder-joint came into the passage in a natural way, and not doubled back, as I expected it would by catching the edge of the pelvis. The placenta came with the foetus.

As soon as we had got the foal away, we liberated the mare from the hobbles and she got up, but had some difficulty in moving about or dragging her legs along, as her hind parts seemed to sway first to one side and then to the other. After she had stood for a short time we attempted to gently walk her along to an old barn about 120 yards off, which was accomplished by supporting her on each side.

We then gave her  $\text{ʒij. tr. opii.}$ , and some water to drink.

6 P.M.—Going on quite as well as we could expect. Eat a bran mash. Pulse 100. She drank in her water, in the course of the evening, 2 doses, each containing  $\text{liq. am. acet. ʒiv.}$ ,  $\text{tinct. aconite gtt. x.}$  Loins well fomented.

Sunday 15th, 9 A.M.—Standing up and progressing favourably. Pulse 80. Feeds on mashes and grass. Gave aloes  $\text{ʒiij.}$ ,  $\text{opii. ʒij.}$ , and in the course of the day two doses of febrifuge medicine as before. Loins fomented and kept wet.

9 P.M.—Pulse 80. Seems swelled across her loins, and is weak and totters. Milk fluent, which is drawn a little.

Monday 16th.—Bowels acting well. Pulse 80. Respiration good. Stands up, but can hardly drag her legs forwards, and totters in her hind quarters. Had in the afternoon  $\text{tinct. aconite, gtt. xij.}$ . A good deal of sanious discharge has taken place from the vagina, but about the latter there is not the least swelling. Loins kept wet.

18th.—From last date to the present she remained about the same. Pulse now about 70. Feeds well, always stands up. Still very weak. 8 P.M.—Was walked out in the field close by for a few minutes, but she is very weak across the loins. Feeds well. Swelling across the loins less.

19th, Thursday, 9 A.M.—We consider her going on quite as well, and think she moves about more freely, and is stronger in the hind parts. Pulse 66. Feeds well. Has not been down yet. Keep loins wet.

Friday 20th, 10 A.M.—On going to her this morning I found that she had been imprudently turned out into the field, and I found her standing shading herself under an oak tree. The

weather was now, and had been ever since she foaled, unusually hot for this time of the year, and yesterday there had been very heavy thunder and rains. I had her brought up. There is now large œdematous swelling about the middle of the lower part of the abdomen, and I think she is decidedly weaker in the loins, and totters more about from side to side on walking her along the field. Bowels moving freely. To be kept quiet for the present.

From this date she gradually got better. The swelling under the belly and on the loins went away, and in the course of a fortnight she was permanently turned out into the field, where she gained strength, and became more steady in her hind quarters, and could canter about very well, and is now shafting in a cart with loads behind her, and does anything that is wanted.

I should have observed that there has been for some time a considerable enlargement about the thick part of the tail, and which exists now to some extent; and there is every probability that this part has been injured by being pushed backwards on extracting the foetus.

---

*Cases of Extraction of a Calf, with Premature Labour-Pains.*

By the SAME.

ON 15th April 1864, 12 P.M., I and my son were called up to attend a two-year-old heifer that could not calve, the property of Mr Heath of the Hole, Marbury. When we arrived, we ascertained that she had been straining for six or eight hours, and that no one had meddled with her. Introduced my hand up the vagina to ascertain the state of the os uteri, which I found not at all dilated. I therefore declined meddling with her, but left two doses of anodyne medicine to be given at intervals.

16th April, 10 A.M.—We saw her, and found that she had not been straining quite so much. Os uteri but little more dilated. Advised her not to be interfered with, and left two more doses of medicine.

18th April, 2 P.M.—Were sent for to see her again, as she still kept straining more or less. On our arrival we found the parts more dilated, but not to any great extent. We ruptured the “water-bag” to ascertain what sort of a presentation there was, which we found pretty satisfactory, and then left her alone for an hour or more. After this the os uteri, by her continuous straining, and the introduction of our hands, got gradually larger, and by perseverance and patience we got the calf away, which was dead, having been so only for a short time.

What I wish to notice in this case is, that the os uteri never gave way, so that one could not feel its substance, but, on the contrary, up to the last, it seemed to be put upon the



stretch, and formed an expansion some four or six inches in diameter, which covered and grasped the head in its passage. The os uteri was like the expansion of the iris, or the inner lining of one's hat turned up flat, with the head forced through and grasped by it. I am inclined to think that before the calf was extracted, the expanded os uteri gave way and a rent was made in it. The heifer cleansed soon after, and ultimately did well.

---

About 8 o'clock on Thursday morning the 23d June 1864, we were sent for to see a two-year-old heifer of William Jones, Esq., solicitor, that could not calve. On our arrival we found that she had been uneasy for several hours, and that nothing had been done to her excepting that the man had imprudently forced his finger through the os uteri and ruptured the membranes. We found that the os uteri was scarcely at all opened as if for calving, and after waiting for about two hours, my son and I tried during that time to gradually dilate it, which we did, so as to enable us to affix ropes to the fore-legs, and having done so, we brought the legs into the passage, so as to give them and the head a start to press through the os uteri when straining. We then left her for three hours, hoping that by straining she would gradually dilate the os uteri without any of our interference.

2 P.M.—Little ground had been gained in dilating the opening in the os uteri. We now tried to dilate it more by forcing our hands up and occasionally pulling at the cords to get the feet and head into the passage, and by perseverance we succeeded in extracting a live calf.

In this instance, like the preceding one, the os uteri formed a broad expansion, and hindered the expulsion of the foetus, which was not removed until the former had ruptured.

*Remarks.*—During ordinary cases of parturition, the opening of the os uteri gradually dilates, and its labia become very indistinct, and form, in a great measure, one flat surface continuous with the inner lining of the vagina; but in some cases, where the animal has not gone the full period of utero-gestation; or possibly, in some cases, where it has done so, the opening does not dilate freely, instead of which the os uteri becomes pressed forward, and its lips become stretched, forming a broad expansion covering the head of the foetus, and is occasionally a great cause in preventing the expulsion of the foetus, which does not take place until, in some instances, it is ruptured, which was so in the two preceding instances, and I have repeatedly seen it in others. People are frequently in the habit, when an animal happens to be straining, of early rupturing the "water-bag," although it has protruded but little: but I think, unless the labour-pains have existed for an undue length of time, and where it would be necessary to make an examination, this is a

very imprudent procedure, as there can be nothing better to dilate the passage than the protrusion, for a time, of the "water bag" itself. Sometimes, where the os uteri is not open, and she is not at her full time, these false labour-pains will pass off if a few doses of anodyne medicine are given.

I have *read* of some cases of what have been *called* "Strictures of the Os Uteri," and where incisions have been made through them so as to extract the calf, but I cannot say that I ever met with any calling for such interference, unless the preceding ones may be considered as examples. In these, and other cases that I have seen, I did not feel any particular hardness of a ligamentous or cartilaginous nature in the os uteri to induce me to divide them, as I hoped the parts would gradually give way and permit the head to pass; but knowing as I do that in some of these cases the foetus does not come away before this tough elastic expansion is ruptured, I cannot see any reason why an incision might not be made, and which I some day may be induced to try, as it may save time to us, and pain to the poor animal. I fear in many of these cases the animal has not gone her full period of utero-gestation, and that neither the os uteri nor sacro-sciatic ligament are sufficiently relaxed, as they are during a natural labour. I am not certain if I have not touched upon this subject in some of my previous communications.

---

*Cases of Extraction of a Calf, with Ruptured Uterus.*

By the SAME.

MR SADLER of the Brook, near Marbury, sent for us, 4 A.M. 30th April 1864, to a two-year-old heifer that they could not get the calf away from. On our arrival we found that his neighbours had been assisting him in trying to do so.

We found the head was pretty naturally situated, and the fore-feet were only a little down, which were soon put right by my son, and the feet and head were soon got into the passage, and after pulling at them pretty freely we got a live calf away, and thought all would be right by a little nursing. We gave her an anodyne drink, and soon after left, thinking we had done our work well and quickly; but we afterwards found out that she died the following night, and on examining her the owner found that her uterus was badly ruptured, and which, I am inclined to think, he felt inclined to give us the credit of causing.

On 11th May 1864, we were sent for to a two-year-old heifer, the property of the late Mr Fowles of Horsa, that could not calve.

Jones and Perks of Marbury, two celebrities of the neighbour-



hood, had exhausted all their skill and strength in trying to get the calf away, and as they could not succeed, they—as their sensible practice is, and before they have done any supposed mischief—recommended that we should be sent for.

We found that the head lay back and down, but which we could not get up until we had taken one of the legs away at the shoulder; after which the head was a good while in coming through the vagina, although hooks were inserted into the orbits and other places; and after some half-dozen of us had been pulling at the calf we got it away. But in the course of the following night the heifer died, and on opening her the next morning we found a very large rent across the neck of the uterus near to the vagina, and a quantity of blood in the abdomen. The calf was one of the largest I ever took away from so small a heifer.

*Remarks.*—I think there is every probability that in each of these cases the uterus became ruptured by excessive muscular uterine action in trying to expel the calf, and no doubt the impaction of the foetus, and the great force used by us in trying to remove it, induced the poor animal to strain more violently. Gooch has observed that in the human subject “the cervix uteri is so much more disposed to laceration than any other part, that four times out of five, when spontaneously produced, it occurs in this place, just at the connection of the uterus with the vagina,” which perfectly agrees with my experience in all the cases I have seen.

Is it possible for the uterus to become ruptured by the calf being forcibly wedged against the vagina, or by its being pressed against the contracted os uteri, and so separate it from the uterus in drawing the calf out?

---

*Cases of Parturition.* By GEORGE BLAND, Veterinary Surgeon, Alfreton.

ON April 1st, 1864, at 4.30 A.M., I was requested to go to a two-year-old stirk of the short-horn breed, the property of Mr Smith, sen., Tansley Nursery, which they could not calve; she had been in labour from 11 P.M. On introducing my hand, I found the presentation of both fore-feet, and the head turned back. I tried to bring up the head, but could not succeed without taking off one shoulder; I therefore ran my knife from the scapula to the foot, then skinned it well up, and divided the muscles, &c., well up, so as to allow it to come off. I next passed a cord over the lower jaw, and another over the head, carrying it as far as the dorsal vertebra, but could not bring it forward, nor could I get my knife to any part except the sternum. Obligated to cut through it, so as to admit the hand, then took out the lungs, heart, and liver, so that the thorax would collapse; then I got it to the eighth dorsal

vertebra, and was again fast; then cut through the diaphragm, and brought out the stomachs and intestines; then we tried again, but could not succeed; then I took it off at the third or fourth lumbar vertebra, leaving skin to form a covering over the bones; then I got a needle and sewed the skin over the bones, so as to prevent the cow from being bruised; then passed it back and brought the hind-legs up, one at once, corded them, and brought them to the hocks; then as fast as ever again, could not move it any more by eight strong men pulling same as had pulled before; then passed my hand and knife to the acetabulum, and ran it to the foot; then skinned it well up, and cut through the muscles and ligament; then it was easily pulled off. After that we were able to bring away the calf. It was an extraordinary large calf for a small two-year-old stirk. Time four hours and a-half. Gave the cow at intervals gruel, and in one lot gave half a pint of gin; ordered hot fomentations, gruel, bran mash, and a little hay. Dressed her with our usual dressings that I have used for nearly twenty-four years; gave her a laxative with fever medicine. Before I left my patient, it began to pain her more than I liked; ordered her *Opii Tinct.* ʒij. On the 2d, I saw the cow again doing very well, eating mashes, a little hay, drinking plenty of gruel, and ruminating nicely, and giving three pints of milk at a meal; dressed her again, and gave fever medicine. On the 3d, they came over to my house, and said the cow was still doing very well, eating and drinking everything they gave her, ruminating, and gave a nice meal of milk; gave them dressings and medicine. On the 4th, I saw my patient again, found her not so well, respiration quick, pulse 131, attended with a great deal of fever; ordered fomentations to be continued, gave her more fever medicine, and dressed her again. On the 5th, saw her again; doing very well, eating, drinking, and ruminating, and increasing in her milk; ordered her a little oil-cake and a few turnips. On the 6th, I was going by and called; she was still going on well. On the 8th, was again going by, and called; she was quite restored to her usual health, and giving a nice quantity of milk.

On the 8th of May, at 5 A.M., I was requested to go to a cow, the property of Mr Rawson, Birchwood, she was an aged cow of the short-horn breed, which had been ill for two days and nights, and nothing appeared. When I introduced my hand, I found it was a presentation of all four feet. I tried the usual way, but could not succeed; I then passed it back, and tried the other way, and still was fast; I then found it necessary to amputate one shoulder, but when doing that, I was obliged to take off the other fore extremity at the scapula, before being able to bring up the head; then after that, passed a cord over the head as well as having one on the lower jaw; then brought it with ease. Time twenty



minutes. Gave her a little medicine, and dressed her once, and she went on as though she had calved herself, and in three days was turned out with the others.

On the 8th of May, a very valuable dark brown mare, of the cart kind, with a deal of bone and substance, and very cleanly and in very high condition, the property of Messrs Coke & Co., Sleights. A presentation of the cervical vertebræ, and both legs quite back; the mare in great pain and agony. Gave her a laxative ball, and Tinct. Opii  $\text{ʒij}$ ; then I proceeded, believing the foal to be dead. I brought the head, skinned it, and took it off, then brought the legs up and soon took it away, and relieved the mare. Time 30 minutes. Ordered her mashes, a little hay, and gruel to drink, and a little fomentation. On the 9th, I saw her again; doing very well; dressed her, and gave her a fever ball, and left her a few more. Saw her again on the 11th; doing well, ordered her a little grass, and in eight days she was quite recovered, turned out in the day-time, and ready for work.

---

*Observations on Short-Legged Horses.* By JOSEPH GAMGEE, Senior,  
New Veterinary College, Edinburgh.

THERE is no sentence in the English language in common use amongst horsemen, that more needs a glossary than that which I have selected for the title of this paper. "Short-legged horses," or "standing on very short legs," are the words observable constantly in the advertising columns of our sporting journals, as recommendations of the horses to which reference is being made.

The questions, which I am again submitting to my countrymen and professional brethren do not relate merely to words, but mainly to phenomena. I may refer probably to some which readers will think are already well known, or do not relate to the subject. I trust, however, that allowance will be made for my earnest dealing with the whole, when I state that it is several years since I published some of the results of my investigations; and though any one of several views brought to notice three years since, if duly considered, might have led the working veterinary anatomist to trace on to farther steps, yet no notice was ever taken, either by the presiding teachers at the older veterinary colleges, or by the editors of the only periodical in Britain which assumes to inform the profession, besides that which is the medium of my communications.

So highly do I consider the acquirement of an intimate acquaintance with the component parts of the limbs of the horse and their true functions, that I believe in the whole being a great matter of public importance, worthy the attention and talent

of a Professor Owen, a Goodsir, and other like philosophers, as much as any one subject of comparative anatomy to which they have devoted themselves.

From the earliest days to which the literature of Greece conveys the mind, the conformation and action of the horse formed the themes of men the most wise, eloquent, and brave.

Though Xenophon affords no proof in his writings of an intimate knowledge of the smaller details of the anatomy of the horse; yet his descriptions of the external form and action of that animal so far surpasses that of all other writers, down to the present time, to the extent to which he wrote on it, that it is more than probable the details were known, and that the great general was doing that which a similarly eminent man would do in our time. He gave a plain, popular account of this subject for the use of the officers in his army.

Another acute observer, writing two thousand years later, also teaches from what he saw of the horse, as he was "open to the inspection of the ordinary observer;" and so Solleysell formed the last link in the chain of great names amongst writers on the horse, of which Xenophon was the first, with whose works we are acquainted.

To the memory of the renowned Monsieur Bourgelat the world is indebted for a scrupulous respect to all the ancient lore to be found on his subject, with which he brought into operation all the most advanced views which the modern science of anatomy at the time could furnish.

The great founder of veterinary colleges, with consummate eloquence, limits his remarks on structures and their functions mainly, to the extent which seemed to him necessary to lay down fundamental precepts, for the uniform application of a system of shoeing horses throughout the French army and France.

We were not only late in the field amongst the nations of Europe in establishing scientific institutions for the purpose of cultivating a thorough knowledge of the horse and other animals, but when the work was begun we were, accidentally I suppose, unfortunate. From the time Monsieur de Sainbel wrote his "Essay on the Proportions of Eclipse," it appears to me, looking back to Lord Pembroke and Freeman's works, that the confusion on the form and action of the horse, so far as the writings and school teachers show, may be said to have taken fresh root.

The opening paragraph of Monsieur Sainbel's chapter on the action of the gallop, runs thus:—

"It is well known to all who have observed the action of the horse, that the gallop consists of a repetition of bounds or leaps, more or less high, and more or less extended, in proportion to the strength and lightness of the animal."

Without entering into an analysis of the above, I simply state that any man, making the above paragraph the syllabus of a work



on that subject, must end with more confusion than he begins it withal, and must mislead his followers in proportion to his ingenuity of expounding and substituting wrong for right views.

This subject is one which can be helped by comparisons. Taking, firstly, an every-day occurring fact, we will suppose two blood-horses of about equal height placed together ; one of them such as we should call a wide, deep-barreled, well-proportioned animal, esteemed as such by good judges ; the other a slender-carcassed horse, deficient of measurement in girth, and relatively lacking capacity for viscera and organs, as well as form for connection of the limbs and the attachment of muscles. We have, in the supposed cases, a strong horse and a weak one, and if tried, it will be found that the stout and robust one will be fast relatively to the other. Such horses are called, according to current language and prevailing ideas, respectively short-legged and leggy animals. What in such case is more natural than for a man who has examined for himself, and who can pledge reputation and word in proof of his statements, than, speaking from knowledge to say, It is a mistake ; we have not a short and a long legged horse, but two animals whose limbs are precisely of the same length ; and measuring each separate bone I cannot discover a line of difference.

If we now remove one blood-horse, and place beside the other a common-bred horse of exactly the same height, allowing choice as to whether this last be of the best formed Clydesdale or of the Suffolk cart breed, or whether he be of the worst from amongst the large-headed, slender-carcassed, hairy-legged sort to be found on the Cambridgeshire fens ; taking either of these horses as a standard for comparison with the blood-horse, it will be found, though all may be of the same height, that the horse of eastern breed will exhibit the longest legs, and that the others will show less length in the order in which they are named above ; but the difference in length will not be apparent, if we measure in a direct line from the bottom of the pedal bone to the top of the scapula ; it will appear chiefly in particular bones, and in their more angular relative position in the thorough-bred over those of the other horses.

No one more than myself can appreciate a symmetrically-formed horse for all purposes, of whatever breed or size, in preference to one disproportionate in shape, whose want of proportion is commonly observable by his having a slender carcass, with apparently long legs, and hence he is pronounced a leggy horse. I constantly adopted the same words myself during the greater part of my earlier professional career ; nor should I enter on a discussion now, if I did not, after the proofs I have obtained, see the necessity of trying, by analysis, to establish a systematic knowledge of the locomotive functions of the horse. In the process of my investigations into the economy of

the foot of the horse, three or four years ago, and the causes of accidents and diseases to which the various structures of the limb are liable, some phenomena were made manifest, which I had not up to the time anticipated; and such occurrence will surprise no one accustomed to toil with an earnest endeavour to elucidate Nature's works. Amongst the questions, that were in turn to be solved by myself, was that on the relative length of the different bones in the fore and hind limbs of the horse.

Whilst pursuing my course of observations on horses, individually and comparatively, I had recourse to other animals, especially referring to the skeletons of many of different species for comparative purposes; and, after noticing that of the elephant, the camel, and the ass, and seeing the arched form of their spines adapting them to support weights as beasts of burden, and then again having regard to the horse, the spine of which I find modified, and provision made for speed, with the easy and elegant carriage of that animal, design, and the causes which give the result, are made evident. The uppermost bones in both the fore and hind limbs are intimately connected with the trunk of the horse, and the terms leg and foot, as applied, are vague, and, whether taken in their technical or ordinary meaning, the same want of definite import prevails as to where one ends and the other begins; it is not, however, until the inquiring mind descends from a contemplation of the parts above to the knee and hock joints with the foot, that descriptions and functions attributed are found totally inconsistent with those with which the parts are endowed.

A few words on the mode in which animal locomotion proceeds. No matter whether it be a biped or quadruped, the laws of movement are the same. Anatomists attribute to the horse a faculty with which he, like other animals, is not endowed; they say that the horse, from the elastic and angular construction of his limbs, can spring at once from a stationary position, whilst man requires preparatory movement: yes, and so does the horse; the only difference being one of degree; through the angular formation of the horse's limbs, he can, by suddenly approaching the upper shafts, and with a backwards depressing attitude effected on the body, make a bound, without having previously moved a foot. The same faculty is conferred on other quadrupeds, and even bipeds, as instanced in birds, preparatory to their taking flight from the ground.

We are generally agreed, I believe, that it is essential for a horse to have a well-formed capacious carcass, whether for training into a Derby winner, or to carry or draw a great weight, and the preference which custom has sanctioned is right; because the whole muscular energy which sets the mass moving and keeps it going, all arises from, and depends on, the trunk, which may be considered in the light of an engine placed on its carriage.



Regarding the horse once more stationary, his feet must be looked on, as passive points of support, which, when viewed in connection with the limbs, are seen to form the points of resistance on which the whole leverage power, when developed, becomes exerted. Again, let us turn our eyes to the trunk of the horse, taking with it the neck and head—most important these, in their relative construction, as sources of muscular origin and energy. The anatomist alone is capable of appreciating fully the relationship of the trunk and the several bones which form angles one with another, through their respective relative connections—viz., the scapula with the humerus, and this last with the radius, which, with the ulna or elbow—and which in the horse, are united as a single bone—together form one shaft in the horse of rather more than a foot and a-half in length from the point of elbow to knee-joint. It is the three bones just mentioned which, in the fore limb of the horse, afford the sole medium of every atom of force which is created in the limb; and that force is either diminished or multiplied according to the proportion and conditions of structures, which are acted on from the radius to the ground. In the hind limb, the haunch and thigh bones, with the tibia, and its short complementary fibula, and the important pulley, the patella, make up the same system of shafts, forming, one with another, angles which, when put in motion by the muscles emanating from the trunk, produce strokes similar to those that may be witnessed when observing a steam-engine at work. These shafts complete their strokes of action where the tibia meets the hock-joint, where, as in the case of the fore limb, another system of structures are put in motion, their mutual perfection depending on general normal conditions.

Whilst endeavouring to bring the question to a settlement respecting the relative merits of the length of given bones, it will be well to try and solve another, to the satisfaction of all whom the matter concerns—and they are legion. That which has, by some unaccountable licence given to imaginations, been called a “suspensory ligament,” will ere long, in all probability, cease to be heard of by the same name, and especially under the same confused notions of its office; confusion greatly increased through the name the structure has borne. The system of passive ligamentous bands, which is seen running between the shaft bones above, receives its consummation where these meet the more energetic levers at the knee and hock joints.

The axiom of nature is always to make her works symmetrical. We accordingly find the several bones in the limbs of horses to bear relative proportion one to another in length, and the whole to other parts of the system; the region of the limbs comprising the knee and hock, to the extreme point of support of the foot,

constitutes the most perfect leverage system of any with which I have any conception.

The faster paces of the horse steadily sustained are those most favourable for studying the phenomena and laws of action; and when the blood-horse is going at a gallop, the fore-limb may be seen extended from the hindmost and upper part of the elbow, to the point of the foot, when the latter is implanted on the ground; the foot being planted anterior to the line of gravity of the body; and in the next instant the leverage is changed; different points constitute the fulcra, until the action of the foot being accomplished, it becomes relieved and lifted. Turning now to the hind limb, whilst the great shafts carry it forward under the body, the distal lever will appear to be composed of all the solid structures from the point of the hock to the extremity of the foot.

At that instant of planting the foot on the ground, alike in fore and hind limb, the angles formed by the bones and joints relatively in the respective regions will be open, whilst those formed by the great shaft bones above, also of both limbs, will be closed to their greatest limit. It is well to note this, because it is a physiological phenomenon of interest.

The instant the foot is on the ground, the relative position of all the bones is changed; the shafts above open out their angles, and, under weight, with force of energy, depress the bones forming the distal shafts from knee and hock. The cannon bone, which, in the hind limb especially, was in an oblique position from the point of the os calcis (hock), with which it acts intimately to the pastern, will, as the body moves over, assume the vertical line, past which, the limb being disengaged, the foot is lifted.

If what I am trying to show be seen and admitted—viz., that the most energetic leverage takes place from the knee and hock to the extremity of the foot, and that the pastern joint with the complementary sesamoid bones constitutes the chief fulcrum, then it will appear that long metacarpal and metatarsal bones, with well-proportioned knee and hock joints, are essential to the attainment of results, such as the force created by the systems above is destined to confer.

About the greatest of all ligamentous structures in the horse which contribute to multiply force and economise muscular energy, I have nothing to add, that I have not many times said and demonstrated, with the aid of the natural structures, before classes, in addition to the repeated publication of my observations; and therefore, from a paper of my own, published in the "Edinburgh Veterinary Review" in 1861, I will make some extracts in preference to rewriting what has not been noticed, and which can never be refuted.

I shall prove that that said powerful ligament possesses no property admitting of elongation, implied by the word elasticity; a property which has been assigned to it, and to which has been



attributed a spring and descent of the pastern joint. Entertaining the belief that this ligament exerts an essential and very great part in progression, I was led to believe that it could not be elastic. I could see no reason why it should be so, but many why such a property would defeat the purpose which I contend it fulfils. Microscopical examinations of the structure of the ligament, prove that it is composed of the white, inelastic tissue, the same as tendons and other ligaments; compared with the flexor perforans tendon, no distinction in character can be revealed by the microscope. The fact is, this ligament is perhaps the most powerful and unyielding in character of any in the component structures of the horse, and is of itself passive—brought into action, however, or set free, according to the position of the limb; and since I have proved that the ligament is non-elastic, and that the sesamoid bones are not suspended by it, I submit that its being called a suspensory ligament is a wrong denomination, founded on erroneous notions of its functions.

Nothing but the cultivation of knowledge on the mechanism of the horse can lead to a right and common understanding of his action. Anatomical investigations, if prosecuted preparatory to, and simultaneously with, observations on the living animal, will assuredly lead to increased knowledge, and to the exclusion of erroneous notions. We cannot learn the movements of the living horse by examining the dead subject alone, and I have found it necessary to examine the structures in the dead, and the movements in the living horse alternately, over a series of years, a process of study which has been attended with constant interest and instruction.

We are apt to connect the notion of strength with hardness of texture; hence we say a horse is powerful because he has plenty of bone; the fact is, horses often have too much bone, when muscle and symmetry are wanting. Nature has accomplished this wonderful structure—a horse's limb—by giving just enough bone to sustain position, and has given joints so that the bones move one upon another, and form levers. She has completed the strength by blending, in strong ligaments, fibrous textures which ply but do not break. I think we may observe the same thing less perfectly accomplished in art; we find ropes running by the side of spars, without which the harder material would not bear the strain imposed on it, and the metacarpal and metatarsal bones of a horse would never bear the strain imposed on them, but for the strength of the ligaments which, running parallel with them, sustain and co-operate; but these ligaments never stretch or yield until their integrity is destroyed.

I hope in this paper to afford evidence enough to settle the question of long or short shank-bones, in so far as my own part extends, of expounding the matter. It is only by reference to these bones after death that the question will be set at rest, and for-

tunately the Marquis of Westminster can show the bones of Touchstone, and compare them with any number of those of common horses, known to have been of the same height with that famous horse. And I pledge myself that the metacarpal and metatarsal bones of that blood-horse will exceed those of every horse of common breed to a noticeable extent. Mr W. P'Anson has also the skeleton of Blinkbonny, and her bones will serve for comparisons in the same way ; and, as good race-horses are constantly dying off, new means of proof are offered.

As a rule, objection should be made to all measurements taken on the living horse for proof on such matter ; because, in the first place, the horse with spare carcass, which wants substance and symmetry, not only has more day-light between his body and the ground than the symmetrically formed animal, whatever be their respective heights ; but his muscles being small, the whole investment of the bones and joints is spare, and we have in the case some approach to the natural skeleton, easily measured during life ; while, on the other hand, the "well-bodied" horse has every structure in his system largely and powerfully developed, and his bones are to a great extent bedded amidst muscles, tendons, and ligaments, and even to the finely-formed leg of the blood-horse these remarks apply, though in the young colt or filly, we can trace the lines of most of the muscles and tendons of the limb ; still, even in these, the most robust have powerfully formed knee, hock, and pastern joints, so that the truest formed animals appear short, while the deformed slender one, looks straight and long between the pastern and the joint above, in either fore or hind leg.

When I made my views in this respect known on a former occasion, I adduced as examples, Newminster, Stockwell, Voltigeur, and other horses of like powerful stamp, to show that substance takes off appearance of length, notwithstanding which, no inferior horse can compare with them for length of metacarpal and metatarsal bones.

It must be remembered that length of bone bears relation to height of horses, assuming them to be of similar breed.

If the phenomenon to which I am drawing attention was one of an isolated kind, and of little importance, I might rest quiet on the subject with what I have said ; but the case being the very opposite, I must extend my remarks.

The mere seeing of parts of an animal, and calling them by names, is not worthy of the designation of anatomy. Our purveyor, in his white apron, politely bows, and announces legs, haunches, saddles, sirloins, &c., knowing each part at a glance ; and such a man's knowledge deserves infinitely more respect, because it suffices for his business, than the smattering commonly made to cover total ignorance regarding the economy of most important parts.



While examining many living animals, as well as referring to the skeletons of various others, I examined the hare, and found the metacarpal and metatarsal bones of that animal to be of great length and beautiful form,—hence her speed; then, dissected the greyhound, and the finest deerhound I ever saw, and also the feet of the collie dog, and found the length of these bones in the first two animals prodigious, and those of the last one short and puny. I have also compared the fox with the domestic dog, and find the speed and durability of the first fully accounted for by the increase of length of the bones in both fore and hind limbs, relative to his size, and markedly so in that of the metacarpal and metatarsal bones. After examining a variety of skeletons of the carnivora, and then looking to the camel and elephant, with the ostrich,—the latter having metatarsal bones one-third longer than those of the Arabian horse,—hence the racing speed of that bird; then passing over some of the animals endowed with hoofs, the plantar surface of foot of all of which is small compared to that of other species, showing the uses for which their lot was cast; and finally, returning to recontemplate the horse, with all the comparative lore which I have been able to collect, I find myself brought back inevitably to the conclusion at which I had long arrived; viz., that ample length of cannon bones is essential to his special faculties.

It would be well if the same names could be adopted for analogous structures as they appear in different animals. I would not advise the altering of names without the greatest necessity being shown for doing so; but in the case of the bones of the horse, reference to which is constantly called for, and these being indiscriminately named shank-bones, cannon-bones, and lastly, and very appropriately, by their anatomical terms, the metacarpal and metatarsal bones, show that multiplicity of names is an encumbrance.

With reference to the first two, there seems nothing very harmonious or significant in the the terms *shank bones* and *cannon bones*. Whilst the technical terms, fully as easy of pronunciation, are significant, because each separate word, metacarpal and metatarsal, have reference to, and distinguish between the bone of the fore and that of the hind limb.

In conclusion, I beg to express, in anticipation of any misgivings of some readers on the practical bearing of the questions discussed in the foregoing pages, that it is only after working into such matters that the mind can sufficiently appreciate them and derive advantage.

Indirectly, the subject, when pushed to its bearings, will lead to good ends. Even as it applies to comparative anatomy the phenomena and systems which the construction and functions of the limbs of the horse reveal could hardly be made out at all by reference and study on the human subject only, though, when demonstrated in the former, their analogy is at once seen in the latter.

I am led to make these truths apparent, because, as is well known, most of the great steps advanced in all departments of the science of anatomy regarding man were first wrought out on the lower animals, and because I have seen that, regarding the locomotive system of the horse, human anatomists, pinning their faith in what they read, have copied into their works the most preposterous views regarding the construction of the limbs, and the action of the horse; and I see these errors so far adopted as to be attributed to man comparatively. There is no telling the extent of opposite effects, which follow from right and wrong interpretations of Nature's works and laws.

The second practical application of my subject concerns the present agitated question on the breeding of horses; the first element of success in which is a knowledge of the proportionate parts constituting a perfect horse, and what deviations tend to the production of monstrosities.

And lastly, the whole matter of cultivation and preservation of horses, and restoration of the systems involved in the foregoing considerations, are of such importance as not to be expatiated on in these few passing words.

To my fellow-practitioners of veterinary medicine I would offer a few remarks. It may seem that I, one of their number who received the ordinary amount of what, by courtesy, has been called a course of instruction in veterinary science, am now sapping the ground from beneath the old structure. They say: you tell us that the horse has no suspensory ligament, and other things equally opposed to ideas which we have regarded as much realities as the bread we eat.

Perhaps it is right that I should explain, as well as I can, how it happens that I see my way to speak of systems comprising structures, functions, and morbid conditions, all of which are of the highest public interest, in accordance to the public worth of the horse. These subjects have been commendably noticed by men of all times, when new light has been thrown on them by investigators.

One incident happened to me in keeping with this state of things which I will note down. My lot having been cast in practice abroad, where I established myself in 1825, and remained until 1855, the arduous duties of my engagements, and the absence of any veterinary school in the place, deprived me of opportunity for prosecuting inquiries and work such as these questions required; and, like the rest of my brethren who have duties to perform, and families to maintain, I saw that it was only at colleges, in public dissecting rooms, and to teachers engaged there, that we must mainly look for the elucidation of the animal system; and that we, as practitioners, must seek to extemporise for ourselves a sound and safe course by eliminating all bad, and adopting good measures in the treatment of patients.

On my final return to England, whilst staying in London with



some time on hand unoccupied, I was desirous of proceeding with the work of which the preceding pages are the fruit. And it being necessary for the purpose that I should re-dissect the horse, and a house not being the place, I applied by note to Professor Spooner, for permission to go to St Pancras and to use the dissecting room of the college for the purpose; which I stated, of performing some dissections on the limbs of the horse.

Days, weeks, and months passed, without any reply to my note being received, when one day in the autumn of 1856, after I had almost forgotten the insult offered, by the non-reply to a note on the part of an official of that institution, of which I had been a member long before himself, I received an uncourteously worded note, signed by Charles Spooner, to the effect that he had laid mine before the managing members of the College Committee, and that they had authorised him (Charles Spooner) to inform me, that my having been a student at that college formerly gave me no subsequent right, and that my request, to take a horse's leg there and dissect it (though in the interest of science), could not be complied with. Sitting by the fireside, as I read that note, I pitched it into the flames in my anger, and sense of wrong.

That which I tried to accomplish eight years ago, would never have been done by myself probably, nor in my lifetime, had not Providence frustrated the will of placeholders. And aims which I had contemplated from my youth—of working for veterinary science—received encouragement, when one of my sons,—who, besides the course at the English school, had worked at those of France, Italy, and Germany, receiving there courtesies and means denied at home, and, through the support of gentlemen, to one of whom I can never show gratitude enough,—was encouraged to undertake the establishment of the New Veterinary College at Edinburgh. The step thus taken, though dictated by friends, to some extent out of good feeling, was really carried out in the public interest; yet, in opposition to that measure, again, the same Professor Charles Spooner began (I will not say to stir heaven and earth), but to agitate men, from the first personage in the realm, through Her ministers, to members of Parliament, and veterinary college governors, down to the junior members of the veterinary profession, Mr Spooner and party bestirred themselves to assure the State that all was well as it stood, that there was no need of another veterinary college in the kingdom, and that it was undesirable that there should be another.

Time, which solves all questions, will settle this also in its turn.

# EDINBURGH VETERINARY REVIEW

AND

## Annals of Comparative Pathology.

---

### DISCUSSIONS ON HORSE-BREEDING.

ON the principle that "Much wisdom is in the multitude of counsellors," we regard favourably all temperate and well-sustained correspondence on the whole subject, or any part, of that which relates to the theory and practice of breeding and managing horses.

A second letter on the question, as it relates especially to race-horses, by Mr W. Dickinson, has been published in "The Times," which will be found at another page, and which, like the first one on the subject "Of Breeding of Horses," from the same pen, published in the "Journal of the Royal Agricultural Society," should be read by all who take an interest in the question.

Mr Dickinson seems to have been led to issue his last letter to defend the former one from some objections raised to positions assumed; and in that he has not only fairly succeeded, but has extended the range of closely-reasoned arguments on well-established evidence.

We regard the free interchange of opinions by experienced men, which have been freely circulated of late through the medium of the press, to be the best possible criterion of the importance of ventilating the whole subject and, fully as affording evidence that the Royal Agricultural Society of England was well advised, when last year it invited the attention of the public to the matter. Far from considering, as some pretend, that the subject is exhausted, and that it is advisable to let it rest; we believe that the fruits to be derived from the past discussions are dependent on the carrying them on, so long as we can obtain successive expositions of phases of questions not easily to be brought out by any one man. And the differences of opinion on similar points of the question afford other evidence that good may still



be expected to come out of exchange of ideas and relation of facts. As a rule, all questions relating to horses are badly discussed amongst us—the cause of which appears to be that, whilst in England there are many more men who know a great deal about horses than there are in any other country, there is also a still larger number of pretenders, whose ignorance of the questions discussed is often in exact proportion to their loquacity and assumption.

Altogether, the whole correspondence on the relative merits of the horses of the present and those of past times has been on the desirability of improving the breed and increasing the numbers of horses, so as to place the means of supply on such footing as to enable it to meet the demand. These questions and others have been more or less treated on in the different essays and letters that have appeared ; and it is most gratifying to be able to state, that scarcely a letter on the subject has come under our notice that has not contained something to recommend its being preserved as complementary to the general stock of forthcoming information, or as containing some new suggestion. Therefore, seeing the importance of the questions raised on horse-breeding and management, and believing that nothing is yet solved regarding it, we shall hail the continuance of the inquiry; and as our pages were amongst the earliest to receive coming views and communications, they will continue to be the medium for diffusing knowledge on such important and elementary subjects, in the interest of property in horses, and that of the cultivation of the breeds, as means may afford.

## CORRESPONDENCE.

—o—

*On Cavalry Shoeing.*

TO PROFESSOR GAMGEE, SENIOR.

SIR,—Many more than myself will thank you for the reply you have made to the remarks I thought necessary to insert in the “*Veterinarian*,” on the subject of shoeing, as practised in the cavalry, and as described by you in the work of which you are a co-author. For it is most satisfactory to find that in your reply there are no facts adduced to bear out the serious assertions made by you on this matter, and which I thought it no less my duty than my interest to question, because it was easy to see that truth was being sacrificed to other purposes than the promotion of professional benefits. Your reply exhibits this in a still clearer light.

No one can have a greater respect, nay, veneration, for age and experience than myself, especially when both have been devoted to the advancement of the public weal in however humble a degree; and more especially do I feel that homage is due when I meet in business confab. with one who is yet an earnest labourer in the field of science, whom age has not much impaired in strength or disposition to use it, and who can proclaim that he has *at least* been *five times* as long a worker in some of the details of shoeing as myself. Viewed in the light of age and experience, of course, I cannot but regret that my experience of this art carries me no further back than some *twenty years*, and therefore am I placed at a disadvantage, which, I have reason to hope and believe will gradually be overcome, and leave me in possession of those qualities so much boasted of by the world. In the meantime, however, I am much consoled by the reflection, that my criticism in the “*Veterinarian*” has led to the discovery, in the matter of age, conjoined with ability, what no other profession can, or ever, perhaps, could show,—a centenarian who writes so well and so instructively on the most difficult problems of a most difficult profession. If I am in error on this point, as I hope I am not, the discovery being based on your own information, then will it afford another example of the danger of making assertions without first knowing the truth, as everybody but those who know better, runs the risk of being led astray. But with all the respect which, I am certain, the veterinary profession entertains for the opinions derived from such unusually lengthened experience, and despite the *prestige* acquired in the minds of the public, by these favours, truth must go first, and will last longest.

My brief experience of the art of farriery does not permit me to extend personal recollections to forty years, neither am I com-



petent, if willing, to defend the reputation of the late Professor Coleman, a subject which has engaged nearly the whole of your reply. From what I have read, heard, and seen, however, I am convinced that veterinary science forty years ago was not what it is to-day; and that citing examples of defects which existed then, will not go to prove that they are still present, unless supported by facts. If the enthusiastic and zealous professor benefited the profession, then is it indebted to him; and if the shoeing of cavalry horses was bad before he came into office, and he suggested measures which have led to the present system of farriery, then I say that more or less the country is indebted to him. My defence of the respected pioneer goes no further than this, and my sensitiveness in regard to the exposure you have credited his memory with, is not so acute as to carry me away from the principal object of my communication.

In the remarks I made, I offered no pretensions whatever to tell one who has devoted such a long career to the subject of shoeing, that the art was in a highly satisfactory and advanced state. I only stated, that the truly dismal report with regard to the efficiency of the British cavalry, as depending on the present mode of practising that art, was simply and briefly incorrect in point of fact. And, I am rejoiced that age and experience has not obstinately confirmed you in maintaining so serious a charge, when informed that there was no foundation for it; at least such an inference is to be drawn from the slender portion of your reply devoted to the real question raised in the article on shoeing, and the total absence of proof to substantiate what is still, on the face of it, a hap-hazard assertion, penned to write up your own views at the expense of anybody or everybody else. Removing the art from home service to the trials of a campaign, damages still more the character of such an assertion, because it is moving it beyond the observation of those whom you, I presume, more particularly intended it for. And giving an illustration from the Duke of Wellington's campaign in 1814, in which a part of, if not one whole regiment, was declared unfit to march from Spain into France, in consequence of lameness, is utterly useless and unphilosophical, unless it can be shown that the cause of lameness was bad shoeing, and that this was due as much to defective principles as neglected practice.

I apprehend, if the truth were known, that shoeing had but little, if anything, to do with this mishap. One fact is patent, and that is, that the whole force of British cavalry did not break down, and there must have been more than one regiment as severely tested as the one you adduce. British cavalry has surely been on active service since fifty years ago, and been subjected to as stern tests as were then undergone. Can no more recent and palpable proof be afforded from among the many great and little wars which have occurred since Waterloo? If not,

your later assertion is as baseless as the first. In my very limited and recent career, I have only been able to participate in the termination of one campaign and the whole of another, and yet am unable to testify to the correctness of your guess ; but of this I am sure, that the want of shoeing on service is a thousand times more likely to induce lameness than being shod, even as cavalry horses are in the field. On active and trying service, when men as well as horses become non-effective, it is but seldom that the horses' shoes are in fault ; and any one who knows what is demanded from legs and feet in the marching and manœuvring of light or heavy cavalry, particularly on service, what with the weight carried and the speed required, will be rather incredulous as to the statement, that our present system of shoeing is the direct, or even remotely proximate cause of a tithe,—an infinitesimal tithe,—of the lameness occurring. Depend upon it, sir, the man who can prevent lameness of limbs and feet, and keep them sound under such trials, must endeavour to transfer locomotion to other organs, which are less adapted for such a function ; for so long as horses are employed as they have been, now are, and seem likely to be, these parts will suffer more than any others ; and I fear it will require the united and vigorous labours of many such indefatigable centenarians as yourself to remove, or even greatly to diminish their disorders. From a careful reading of your reply, one might imagine that it is from your experience of shoeing, as it was carried on in the army forty years since, that you have drawn your inferences. If so, in justice to army veterinary surgeons, such a circumstance ought to have been mentioned in the book which is now before the public. In my humble opinion, far too much is said about a system of shoeing,—I refer now to that practised in Britain, which doubtless is capable of improvement, with the object of vaunting some pet system, that on trial certainly fails, or with the intention of introducing imitations from foreign sources, which are more defective than our own. Many of the complaints urged against it are mythical, and unworthy of a moment's credence, sounding strongly of advertisement for *improved principles* and the bauble reputation. But I am afraid I have trespassed too much on your valuable space, to enter further on a subject so very tempting to the professional man, and the amateur, as a bone of contention, or a peg whereon to hang ideas, crude and fantastic.

So, I trust, in acknowledging the favour of your response, that you will believe me as actuated by no unworthy motives when I felt myself impelled to call attention to the very startling announcement in your article on farriery—an announcement far more likely to do harm than good, because destitute of that article out of which good comes ; thus inducing a result the very opposite of that, I am sure, intended by you. Army matters, I am inclined to think, do not receive felicitous treatment at your



hands, or rather in the pages of the "Edinburgh Veterinary Review," probably because patriotism ever-rides common sense. I need scarcely allude to an article which appeared some time ago, on the condition of the horses at the Curragh Camp, and which was as feebly supported by facts as the one we have been now considering. Those of your readers whom that notice have particularly concerned will readily remember it.

It affords me some regret that your time and patience were required in hunting through the pages of a register to become acquainted with my name; but perhaps a disregard of contemporary literature, or that obtuseness of memory in regard to things which have occurred in later years, and which is but too frequently an attendant upon a stage of life such as you have attained, may account for this necessity. We will put the best construction upon it at any rate. In the meantime, ever anxious to know that our united professional interests and motives are founded on the all-enduring basement of truth, and not on shadowy assertions or vague guesses; certain that much, very much requires to be done before we can safely begin to ignore the services, or impugn the intentions of those who first brought veterinary science into repute in this country; and fully believing that there can be little difference in the views entertained as to its welfare by those who honestly are striving to advance it, I beg to remain, with the utmost respect for your venerable age, and protracted experience, your very obedient servant,

G. FLEMING, 3d Hussars.

MANCHESTER, July 23, 1864.

---

TO G. FLEMING, ESQ., 3D HUSSARS.

SIR,—The Editor of the "Veterinary Review" having afforded me opportunity of replying to yours, 23d ult., in the same number in which it will be published, I beg to thank you for the notice with which you have honoured my writings.

If I foresaw any probability of fruitful results from a continuance of our discussion, I should spare no trouble in prolonging it; but, as I have only written after very careful reflection and extended comparative observation, on men and things connected with my subject, I do not think it very likely that any number of your letters will affect the conclusions I have deliberately expressed.

Honourably moved by *esprit de corps*, it is no matter of surprise that you resist my allegations. When the old firelock was, but a few years since, upheld by "the authorities" as the perfection of a weapon,—when our Commissariat was lauded, while our soldiers were dying of cold and starvation, and our horses were gnawing their tails off, men of the world were rather amused than amazed at the ardour with which the natural consequences of routine and prejudice were defended against exposure. To

those questions time and the ripe judgment of disinterested men have supplied the answer ; and, I have no doubt, will do so likewise in the matter on which, I suppose, we must be satisfied to agree to differ yet a little longer.—I have the honour to be, Sir,  
your humble servant,

JOSEPH GAMGEE.

New Veterinary College, Edinburgh.

---

## MEETINGS OF SOCIETIES.

---

### NORTH OF ENGLAND VETERINARY MEDICAL ASSOCIATION.

#### QUARTERLY MEETING, AND DINNER TO PROFESSORS SIMONDS AND VARNELL.

THE usual Quarterly Meeting of this Society was held on Thursday, July 21st, at two o'clock, at the Neville Hotel, Newcastle-on-Tyne. There was a good attendance of members, and persons interested in the proceedings. Amongst whom were:—The President, Mr C. Hunting, South Helton, in the chair ; Messrs H. E. Wilkinson, Newcastle, and Thos. Thomson, Sunderland, Vice-Presidents ; C. Stephenson, and H. Hunter, Newcastle ; W. S. Moore, Gateshead ; John Hutchinson, South Shields ; Thos. Foreman, Shotley Bridge ; Luke Scott, Hetton ; D. M'Gregor, Seaton Delavel ; Wm. Hunting, South Hetton ; D. Dudgeon, Sunderland, Treasurer ; G. Armatage Pensher, Honorary Secretary ; R. Hall, Sedgfield ; John Fairbairn, Alnwick ; A. Mann, senior, and A. Mann, junior, Lambton ; Professor John Gamgee, New Veterinary College, Edinburgh ; E. C. Dray, President of Yorkshire Veterinary Medical Association, Leeds ; Thomas Greaves, President of Lancashire Veterinary Medical Association, Manchester ; W. M'Kenna, Belfast ; W. E. Naylor, Wakefield ; W. E. Edmundson, Harmby *via* Redale, Yorkshire ; J. James Turner, Northumberland ; T. A. Clarke, Horncastle ; J. Hunting, London ; — Proud, South Hetton ; and W. Cubitt, North Walsham, Norfolk, &c., &c.

The PRESIDENT opened the proceedings by stating Mr H. E. Wilkinson would introduce a paper on the “ Applicability of Legislative Measures for the Prevention of Contagious Diseases ”—A subject which not only occupied the attention of Government as a most important one to the country at large, but as it concerned the veterinary surgeon, deserved his greatest consideration and attention.

Mr WILKINSON then read the following paper :—Mr President and Gentlemen,—If I say that on the present occasion I feel awkward and misplaced, I only confess to the possession of an uncomfortable sense of apprehension, doubtless common to those who for the first time attempt to address an audience ; and the sensation is by no means lessened from a consideration that my subject is much better understood by a majority of my hearers than by myself. I trust, therefore, in introducing a few general remarks “ On the Applicability of Legislative Measures for the Prevention of Contagious Diseases,” to receive from you as much of your kind consideration and forbearance, and as little of your criticism as possible. One pleasant duty, however, at the outset is mine, viz., on behalf of our young association, to bid a cordial welcome to those distinguished strangers—members of our profession—which I see before me. Much as we have to thank the Royal Agricultural Society of England for again honouring our smoky town with the splendid exhibition which they have brought, for the pecuniary assistance and countenance accorded to our profession and its college ; still I feel on the present occasion we have more especially to thank them for the opportunity



of meeting with those gentlemen who are in attendance here through its presence, and giving us an opportunity of conversing with them. Not long ago, much the same question of veterinary inspection as that we are now met to discuss, agitated the legislature of the Royal Agricultural Society—the only difference being, that in one case the diseases were of a hereditary character, whilst now they are of a contagious order. To the credit of that enlightened body it was decided to retain veterinary inspection; had they not done so, I feel assured, from an experience gained during the past two months, they would on the present occasion have admitted many horses, the only object of whose owners was not the improvement of the flesh, but to get rid of their individual specimens. The applicability of legislative measures for the prevention of contagious diseases in cattle is a subject that cannot be indifferent to the veterinary surgeon, since, whether we consider measures present, past, or to come, it is through his instrumentality the desired object is sought to be gained, and in him, as a rule, rests the success or failure of the scheme. With the habits and tendencies of professional men, I believe many of my brethren have waited to be consulted rather than take the initiative in the matter. Another reason for apparent apathy may be found in the want of opportunity for discussion, such as the meeting-rooms of our local veterinary medical associations will for the future afford us. Suffice to say, I have not heard of any discussion on the subject amongst the veterinarians of the North of England. The Newcastle agricultural club, formed for the purpose of looking after the agricultural interests in parliament, held a lengthened meeting on the subject in this town;—the result of their deliberations being, so far as I could gather, that they deprecated any interference with the right of circulating disease amongst themselves, but strongly objected to having any imposed upon them by the foreigner. An Act passed in the 12th year of the present reign, entitled “An Act to prohibit the importation of cattle, sheep, or other animals, for the purpose of preventing the introduction of contagious or infectious diseases, is the first active parliamentary interference with the subject; the same sort of quarantine is ordered as in cases of cholera in the human subject—those imported from suspected districts are alone inspected; the detection of disease rested with the officer of customs, and, if he deemed it necessary, a veterinary surgeon—not necessarily a member of the college—could be employed, and in his opinion an Order in Council obtained for the destruction of the cargo. So imperfect and routine a measure was only interfered with in 1848, when a special order was obtained referring specially to sheep and lambs; and again in 1856 (July), when the detection still rested with the custom-house officers, the proof with the veterinary surgeon, and the disposal of the suspected stock with the commission of customs. About that time, or shortly afterwards, the proximity of a fearful and fatal murrain in Mecklenburg called the “steppe-murrain,” created much alarm both there and here, and at once aroused the attention of our Government. An order in council was issued, bearing date September 6th, 1856, which is still unrevoked, and is the law upon which the examination of imported cattle is conducted. I have made certain extracts from it, and I think you will agree with me that its provisions are at once ample and decisive, and, so far as our profession is concerned,—had the diploma been recognised,—complete in the highest degree.

“1st, On the arrival of a vessel with cattle, sheep, lambs, or pigs, the attendance of the veterinary surgeon is to be obtained as soon as possible.

“2d, After the cattle, sheep, lambs, or pigs have been landed, they are to be kept in charge until each animal has undergone a careful examination, and, if found free from disease, the whole are to be passed immediately; but in the event of any disease being found to exist, such of them as may be so diseased are to be immediately killed, if the same be considered necessary by the veterinary surgeon; and if, upon a *post-mortem* examination of such cattle, sheep, lambs, or pigs, the same be found fit for human consumption, they and the rest of the importation are to be delivered to the owner or owners thereof; but should any of them so examined be unfit for such purpose, and the disease be of an epidemic



or contagious character, they are to be buried, or effectually destroyed in the presence of an officer, and the remainder of the importation detained for further examination so long as the veterinary surgeon may deem necessary, and dealt with as before directed. The expenses incurred in detaining the whole or part of any importation, or in killing and destroying those unfit for human food, to be defrayed by the owner or owners.

"3d, Sheep and lambs are not to be examined after dark, daylight being absolutely necessary for the detection of certain diseases.

"Lastly, the veterinary surgeon is to be required to keep a record of the particulars of each transaction agreeably with the annexed form."

Here follows a lengthened and very minute list of the various signs by which the diseases, "steppe-murrain," and "pulmonary-murrain," are invariably recognised; and however culpable may be our Government for the apparent apathy which is considered to characterise their movements in any particular, no one can doubt the complete and most elaborate system developed in this one at least. Then follows equally as complete "precautionary measures," to be adopted for the purpose of stopping the spread of diseases, such as burning the bodies, hides, &c., or otherwise thrown into deep pits dug for that purpose. This, gentlemen, is the law as it at present exists for preventing the importation of cattle affected with infectious or contagious diseases. At the port of London, where the largest importations arrive, a staff of veterinary officers and quarantine sheds, and killing shops are provided, the latter at the expense of the Steam Navigation Company owning the cattle boats. At the outports, where cattle are imported, veterinary inspectors, *now* I am informed, necessarily members of one of the recognised colleges, are appointed by the Board of Trade. All cattle, irrespective of numbers, or the port of embarkation, are examined,—the fee for such being ten shillings and sixpence per cargo; in London, however, the inspectors are paid one guinea for every day they are employed. From my experience of the system during the time I have acted as inspector at this port, I am perfectly satisfied that the system works well. Every advantage is attempted to be taken by the foreign cattle-dealers, and by their agents the English cattle salesmen; but as, on the other hand, every assistance and support is rendered by the custom-house and by its officers, it is the inspector's fault if his authority is not properly recognised. When first appointed here, I had several importations of foot-and-mouth disease; and threats, entreaties, veterinary tribunals, and law-suits were alike pointed at my devoted head, and with the like result, viz., increased obstinacy on my part not to allow any addition to the already over-stocked market of murrained animals. A more pitiable and loathsome sight than the crippled, slaving wretches presented, it is difficult to imagine; and my qualms of conscience never ceased until I saw the carcasses in the killing-shop. Never, under any circumstances, have I objected to the sale of the meat from these animals;—indeed, it is surprising to find what is so foul without so fair within. This is the law, gentlemen, and its present working, so far as the importation of foreign cattle is concerned; and as, in my opinion, febrile diseases of a contagious and infectious type, affecting our domesticated animals, are on the increase both here and abroad, I for one am anxious to see this law, however imperfect it may be, fully carried out until a better is substituted. And, if we are to retain the right of freely circulating those infectious ailments we at present possess, do not let us fly to those we know not of; and, whilst we open our ports to the free trade of the foreigner—whose presence has become, I regret to say, almost a necessity—let us at least require that he visit us with clean hands. And now, gentlemen, I turn to the recent attempts at legislation on this subject, the results of which, I fear, like Mahomet's coffin, are in a state of indescribable confusion. During the past session, a bill was brought into Parliament, which, after being referred to a select committee for amendment, presented the following title, viz., "A Bill to make further provision for the Prevention of Infectious Diseases amongst Cattle;" and its preamble states that "It is expedient to consolidate and amend



the law for the prevention of the spread of contagious or infectious diseases amongst cattle, in the United Kingdom of Great Britain and Ireland." Most of my hearers, doubtless, are as conversant with the provisions of this bill as myself, I shall therefore allude only to some of the leading points:—1. It proposes to take cognisance of horses, mules, asses, neat cattle of every description, sheep, goats, and swine. 2. The terms "infectious" and "contagious diseases" are intended only to apply to such as are specially named in the schedules, viz., Schedule 1st comprises "Glanders, sheep-pox, or variola ovina, and steppe-murrain; Schedule 2d, Pleuro-pneumonia and scab. After dealing with the public exposure of diseased cattle in such places as roads, woods, forests, &c., and the penalties to be enforced, a special provision is made for the sequestration and exposure for sale of such animals that are diseased, apart from those deemed healthy. It also prohibits the giving of uncooked flesh to swine under certain penalties, and provides for the appointment of officers, inspectors, and so forth. The deficiencies of the bill as a legislative enactment appear to be briefly these:—While it makes provision for the recognition of certain diseases as being contagious or infectious, no notice is taken of, or provision made for, such diseases that may in future arise of either character, or diseases which may take on a contagious or infectious character. Also, while it prohibits the exposure of diseased cattle in roads, commons, or in woods, fields, stables, railway stations and trucks, &c., and open markets, it legalises the sale of the same in markets or places which are set apart for that purpose. And, lastly, it wholly exempts from its supervision that fearful scourge, "foot-and-mouth disease." As far as I may judge, this is a great omission, believing that the losses which accrue to the owner from its effects are scarcely paralleled by any other, even pleuro-pneumonia itself. True, it is the owner in the latter case who loses the animal, while in the former disease a death is a rare occurrence. But there are losses of this kind,—the loss of sale, which is a loss of money; a loss of condition, which is a loss of money; a loss of season, which is a loss of money; a loss of grass, which is a loss of money; a loss of time, which is also a loss of money; besides, there is a great liability of all others which are brought afterwards being rendered similarly unprofitable, and, together with the natural suspicion which prevails for some time afterwards with respect to his stock, adds considerably to the owner's losses from the causes mentioned. I am indebted to my friend Mr Hunting for the following facts in relation to this fearful disease:—

"Dear Wilkinson,—Herewith I send you a short account of a few cases of 'murrain' which have occurred in my practice this year. Appended to each is an approximation of the loss, by expenses, &c., it entails upon the owners of the affected stock.

"*Case 1.*—Mr Ora Wood, Seaham, a tenant under Lady Londonderry, keeps about thirty cows, all in high condition, being a new-milk seller. Average worth of each animal, L.20. This farmer bought a new calving cow at Newcastle market, which showed symptoms of the disease on the sixth day after coming home. This was not a very severe case; but one of the quarters became affected, being inflamed and indurated, causing much loss, not only of milk, but condition. Within a week eight others contracted the disease, two of which were very severe cases, one suffering mostly from the feet and irritative fever, the other from feet and udder also, two quarters of which became indurated. The disease went through all the stock on the farm, including several steers and queys; one of the steers—a two-year-old—died, the hoofs separating from the vascular structures. Mr Wood estimates his loss from this attack of murrain at not less than L.70 or L.80.

"*Case 2.*—Mr Errington, of South Hetton, bought a cow at Durham fortnightly fair. A week after coming home she became affected with 'murrain.' Several cases in addition soon happened. One cow, of a delicate constitution, has never been well since, now four months ago. The loss to this farmer—a new-milk seller—was very considerable, certainly not less than L.25.



"*Case 3.*—Mr John Willis, Seaham, keeps twenty-eight cows. Bought a cow at Darlington market, which brought the disease into the byre. At this farm the cases were not severe, but four cows had very bad udders, but no quarters indurated. The loss of milk and condition, &c., could not have been less than L.20.

"*Case 4.*—Mr Errington, Stony-Gate, Houghton-le-Spring, keeps twelve cows. The disease was brought into this byre by a cow bought at Newcastle market. All the other cows took it, one proving a very bad case. The pigs on the same farm also became affected, two of which died. Even some fowls were attacked. Estimated loss about L.25.

"*Case 5.*—Mr Sanderson, of Low Grounds, Seaham Harbour, also got the disease among his stock, numbering about twenty head, and, by condition and milk being thereby sacrificed, estimates a loss of L.20.

"There are many similar cases I could give you, but time will not allow me. Suffice it to say, that few men can take a cow into any of our cattle fairs, and bring it out again without contracting the disease. As a proof of this, I may say that, in this district, the disease is always much more prevalent for a month or five weeks after Durham and Newcastle cattle fairs than at any other time, —certainly in the ratio of ten to two. My own opinion is, and has long been, that the annual losses to the farmers and dairymen of Britain is enormous from this disease alone; in my own practice, certainly not less than L.1000 per annum, which I calculate as follows:—one hundred customers at L.10 each = L.1000.

C. HUNTING."

And now, gentlemen, having reviewed the various agents by which cattle traffic is governed, let me as briefly as possible state a few reasons why I think legislative interference, if properly carried out, would be useful, at least to the agricultural interest of my own district. In this locality, the heart of the coal trade, and birthplace, if I may so call it, of that vast railway system which of itself has done more to revolutionise our social system, its agriculture, manufactures, and commerce, than any other means—in this district, agriculture gives place, and is quite subservient to, the large mining and manufacturing establishments with which it is studded. Our farm holdings are small, averaging barely 200 to 250 acres. The whole of the produce is sold on the spot, or in the neighbouring market, and what more cattle are needed—what milch-cows are required—are purchased, as a rule, in Newcastle or some public market, and the animals so purchased run the gauntlet with the infectious diseases of a market never clear from them. The cows are seldom bred from, and the bringing of fat ones to market, and purchasing calvers, is a matter of constant occurrence.

The President took occasion to remark, that, as doubtless there would result the expression of various opinions on such an important subject as that which was embodied in the paper, in order to give every person an opportunity of so doing, he would ask the gentlemen to confine their remarks to the space of five minutes.

Mr THOMAS THOMPSON, Sunderland, said he thought no one would deny the great necessity which existed for legislative interference, and would ask what means should be suggested for preventing the spread of contagious diseases?

Professor GAMGEE said—In rising to make a few remarks on the subject of Mr Wilkinson's paper, I cannot allow the opportunity to pass without congratulating the members of this association on the important step they have taken in combining for their mutual good and that of the profession at large. Associations such as the one I have now the honour of addressing are destined, in my opinion, to bring about the great reforms loudly called for in our systems of veterinary education and practice. It is quite refreshing to notice the zeal and the regard for the welfare of these associations manifested by the presidents of the Lancashire and Yorkshire societies in travelling thus far to attend this meeting. Turning, however, to the subject of the paper just read by my friend Mr Wilkinson, I can only say that the fact of such a paper being read



shows how the minds of veterinarians and others are being moulded in the right way to bring about that force of public opinion essential for all good works, and especially for securing rational and effective legislation to meet any crying evil. Mr Wilkinson's paper cannot fail to be of great service to the cause which its writer is advocating ; and how necessary it is that such papers should be read and discussed at meetings such as these is proved by Mr Thomson's query—"What are the best means of preventing the contagious diseases of our domestic quadrupeds?" The opposition manifested in various parts to the adoption of any measures for checking the traffic in diseased animals arose from the ignorance as to the effect of sanitary rules in checking plagues of all kinds, and especially those of a purely contagious type. I am delighted to hear from Mr Wilkinson that his views coincide with mine as to the losses sustained in this country from that troublesome disorder, the foot-and-mouth complaint. I have been attacked for exposing, by irrefutable and certainly trustworthy statistics, the nature and amount of the loss sustained by the farmers in this country through the epizootics which entered this island when our ports were opened to foreign stock. Confirmations of my statements, such as those made by Mr Wilkinson, are of the highest value to me and to the cause I have fought for single-handed now for a number of years. I was much startled when I heard that there were veterinarians and veterinary professors who said that they had been striving to learn how, and to what extent, there was loss sustained through the foot-and-mouth disease by the British farmer, and that really only a trifling loss was ever experienced. By this and other diseases millions sterling vanish annually ; and I can with safety refer you to the calculations I have made on the subject, and which are to be found in the Fifth Annual Report of the Medical Officer to the Privy Council. Government is, I believe, satisfied that my statistics are unanswerable, and contain no exaggerations. To this fact must be attributed the recent stand taken in Parliament to legislate on the subject ; and if an Irish clique has for the time neutralised the Government influence in so good a cause, we must look forward to further and warmly contested battles, and in the end to the achievement of an object much to be desired for the relief and benefit of the British stock-owner.

Mr THOMPSON thought the most advisable course would be to follow out a definite plan of inspection, so as to arrive at some data on which to base our calculations of the extent to which these diseases prevail ; and the first essential point he thought to be obtained is the confidence of the owner.

Mr D. DUDGEON thought the foot-and-mouth disease should be included in the bill to be brought before Parliament next year ; for he was convinced that, from experience which he had gained in the matter, the losses were far more considerable from it than any other cause.

Mr H. E. WILKINSON considered the only effective check which could be brought to bear upon the present traffic in diseased animals would be to organise at once a body of efficient inspectors, who should be thoroughly qualified veterinary surgeons of tried skill, and well known for their probity and firmness of principle, receiving their power of action from Government, and devoting their whole time and scrutiny to public markets in order to detect diseased cattle, and make a public example of unprincipled salesmen. To begin at the byres is to begin at the wrong end, the markets afford the principal scope to a properly qualified inspector.

Professor GAMGEE suggested that Veterinary Medical Associations, such as this, should set about collecting all the information possible on the subject, in order to furnish statistics of the ravages of contagious diseases ; they should also report on the same, petition Government, and also co-operate with Government in order to bring about that state of security and exemption from the effects of those diseases. It is a work in which veterinary surgeons should engage themselves, and a work which should be done apart from veterinary colleges.

Mr E. C. DRAY, Leeds, said—As President of the Yorkshire Veterinary



Medical Association, he should feel a great pleasure in doing all that lay in his power in order to collect information, and had no doubt the members of the society would also render efficient aid; but as far as his means were concerned, his practice lying chiefly among horses, he felt very considerably limited; nevertheless some useful information might be gained by a firm co-operation in each society.

Mr GREAVES, Manchester, fully indorsed all that had been stated by Mr Dray, and would use his best efforts to collect information. He might say with Mr Dray, also, that the diseases of cattle almost formed with him the exception; but through his brethren of the Lancashire Society much might be obtained; veterinary surgeons, if desirous, can furnish more valuable information than any other class of men.

Mr W. E. NAYLOR, Wakefield, said he wished to make a few observations, not that he felt he could throw any particular light upon the subject, but more especially with reference to the aspect in which the foot-and-mouth disease was viewed in his immediate neighbourhood. He thought there existed a policy in courting the complaint, and practice appeared to confirm this view. Dairymen who possessed a number of cattle, which were coming on for the purposes of milking, being turned out in large straw-yards, &c., had an infected beast turned among them, and thus the disease was communicated to the whole herd, and the effects completely got rid of before the period of their profitableness and utility had arrived. If they became affected apart from these circumstances, they cast their calf, lost their milk and condition, &c., and proved a very serious loss and inconvenience to the owner. Milksellers, as a rule, object to the use of caustic applications to the feet, as they give rise to much pain and irritative fever, and hasten on the loss of both milk and condition. The worst cases occur when the teats are affected and the calf is suckled, the disease being communicated to the young animal. Bullocks bought at Darlington market in September or October often take it, and even those which have never been near a market also become affected; but no real objection appears to be held against it, as they are supposed to fatten more quickly after it. He had his doubts about its contagious nature, having known byres, in which the cattle have been tied up for months eventually to take the disease, but not then even going through without exception. He had heard of exaggerated cases of aphtha in the human subject, in which it was stated the mouth was severely affected and finger nails came off; but he looked upon these statements as on many others in regard to contagious diseases generally. Young animals and milk cows suffered dreadfully; older animals not so much. In many cases which occurred among two-year old bullocks, first one-half dropped off and afterwards another; but with care and attention all went on well. The worst cases with which he had to deal were those in which large abscesses subsequently formed in various parts of the body; in many instances he had liberated as much as three or four quarts of matter at once; of course the formation of such occupy a great length of time, and leave a very great space or vacant part in the muscles, requiring, however, only ordinary attention afterwards. It was the province of veterinary surgeons to point out and remedy defects in ventilation, and give proper directions to owners for the domestic treatment of live stock, especially with the view of preventing the spreading of disease when the animals were first attacked and found to be affected. He knew there was some amount of difficulty in this, as it was almost impossible for a veterinary surgeon to state, under some circumstances, whether the animals had the disease or not; and therefore he felt it all the more necessary that he (the veterinary surgeon) should be watchful and eager for the first signs by which he could accurately judge. He did not object to the flesh of such animals; in fact, in most instances, he considered it as good as that of healthy ones, that is, if the beast is in good condition at the time of being slaughtered. The contagiousness of this complaint was over-rated, similarly with that equally baneful disease splenic apoplexy, which foreigners state they can produce by giving the infusion of hay which has been allowed to stand to develop the infusoria



which are supposed to produce this malady. He had tried it himself, but having failed in several instances, was undecided as to what the cause could be.

Mr HUNTING gave the details of a case at South Hetton, where, among a quantity of cattle put up to feed, and by the introduction of diseased animals, a loss of upwards of L.200 occurred to the owner by the great impediment to speedy fattening, &c.; in fact, the consequences of such a disaster was very considerable, even without the loss of the animal, and it becomes a question whether, in these serious attacks by "murrain," the loss would not be much less if the animal died at the outset. What was wanted were effective measures to put a stop to the unprincipled practice of disposing of stock which were known to be unsound from infectious or contagious diseases, and also to prevent the farmer taking his diseased animals to market for the same purpose. As a rule, farmers were afraid to let any one know that they had disease among their stock, and therefore kept them on for sometime without medical treatment, or means being adopted for having them slaughtered when in a condition in which no objection could be raised of their fitness for human consumption, and when they think a suitable opportunity has arrived they are sent off to market and sold. A man of his acquaintance sold his diseased stock in Newcastle market; a poor farmer, living within five miles of him, purchased one; he kept sixteen cows, all of which took pleuro-pneumonia from the beast recently introduced, and he lost thirteen of the number.

Mr H. E. WILKINSON asked Professor Gamgee whether, in his opinion, an action at common law could not, in such a case as that recorded by Mr Hunting, be instituted, and damages claimed for injury inflicted, it being well known that the animals were diseased at the time of sale.

Professor GAMGEE said a great deal would depend upon the nature of the transaction and question of warranty; but in all cases when such had been instituted the termination had been successful, and he considered it a proper course to operate strongly against the traffic in diseased animals. Before he concluded, seeing that the time was rapidly flying when they must adjourn, he begged to propose a vote of thanks to the President, whom he had the pleasure of knowing for some considerable time, for whose attainments he had the greatest regard, and considered him a type of the best kind of country members of the profession.

Mr THOMAS GREAVES had great pleasure in seconding the proposition, and heartily indorsed all which had fallen from Professor Gamgee.

Mr E. C. DRAY rose to propose a vote of thanks to Mr H. E. Wilkinson for his instructive paper, and felt that it was almost impossible to thank him sufficiently for laying before the meeting such an array of facts in connection with the sale of diseased cattle and meat, &c., and hoped to see societies of this nature turning their attention towards the means for suppression of this evil. Much might be done by a well-timed and spirited co-operation in this as well as other matters of interest to the profession. In their own (the Yorkshire) society the subject of malpractice and alleged want of skill, in which Mr Forbes, of Reigate, Surrey, had been mulcted in heavy damages, had been considered at some length, and terminated in a resolution being passed, requesting the Hon. Secretary to write for further particulars of the case. Such matters were of the deepest importance to the profession, and he would be glad to see its members alive to their interests and protection. Societies of veterinary surgeons should take cognisance of them for mutual good.

The Hon. Secretary, Mr G. ARMATAGE, had great pleasure in according his support to a vote of thanks to Mr Wilkinson for the paper which he had brought forward, and felt it had been duly appreciated by all present; as for himself, he was glad to have the opportunity of hearing the subject of legislative interference, with regard to cattle diseases, so thoroughly gone into. That there is a great necessity for legislation, there is no doubt, but he for one felt a great difficulty in thoroughly and effectively putting a stop to the evils which existed; and thought it a subject which the veterinary surgeon in practice should approach very cautiously. Farmers are proverbial grumblers, and any embargo placed



upon one would render him more tenacious; and particularly, if his own veterinary surgeon had the power of placing the stock on his farm in quarantine, would his utmost vengeance descend upon him, and to the cost of the practitioner, however just he might be. Undoubtedly the most suitable persons for inspectors are qualified veterinary surgeons; a staff of which, with powers from Government, would render efficient aid—but only when their whole time is given up to the duties. In his opinion, the foot-and-mouth disease possessed remarkable powers and eccentric characters, but nevertheless very destructive to the profits of the owner. Out of upwards of 100 feeding cattle, belonging to his employer, the Marchioness of Londonderry, very few escaped the complaint. In one byre, five or six standing next to others very badly afflicted never took the disease; one, however, of the worst, died from extreme prostration, arising in consequence of profuse salivation; and when the time arrived in May last for the sale of the whole, no difference could be detected in their condition; but it must be remarked, the feet were but very slightly affected, and never required dressing. The treatment adopted, was the administration of two drams of ferri sulph., once or twice a-day, in water, which acted as a good wash for the mouth, as well as tonic.

At this stage dinner was announced; when the company adjourned, and were joined by Professors Simonds and Varnell, R. L. Hunt, Esq., President of the Royal College of Veterinary Surgeons, Birmingham, &c. &c.

The dinner was served up in the large dining hall of the hotel; and on the right of the President were seated Professor Simonds, R. L. Hunt, and E. C. Dray, Esquires; on the left, Professors Varnell, John Gangee, and Thomas Greaves, Esquires—Mr Thomas Thompson, Sunderland, occupied the vice-chair.

On the removal of the cloth, the PRESIDENT proposed the Queen—the pattern of sovereigns, and brightest example to the mothers of England. (Cheers.)

He next gave the Prince of Wales, Princess of Wales, and the rest of the royal family; the latter of whom, although but recently become one of us, we had however felt already that she possessed the love and sympathy of the whole nation; for, whilst she, as it were, was compelled to wear a smile of satisfaction and happiness, as becoming her position here, no one could estimate the harrowing sensations which were doubtless gnawing at the heart, in consideration for her father, mother, brothers, sisters, and friends at home, and her country now mixed up in the horrors of war and bloodshed. (Cheers.)

The PRESIDENT afterwards proposed—"The Army, Navy, and Rifle Volunteers."

Mr C. STEPHENSON, Newcastle, briefly responded.

Then followed from the Chair, the toast of the evening—"The Veterinary Professors of the Royal Agricultural Society of England." The President reviewed in most glowing terms the career of Professor Simonds, as the senior Professor, and in connection with works which had become an authority in veterinary matters,—such as his treatises on "The Teeth," "Variola ovina," &c., &c., together with the valuable assistance rendered in regard to the late outbreaks of small-pox among the sheep in the Southern counties. No matter whether we regard him as a teacher in the occupation of his professorial chair, as a friend and guide to the young and inexperienced, he might say the sterling character of Professor Simonds was as great as his professional qualities. (Cheers.) What he might say of Professor Simonds, he could say of Professor Varnell—ever ready to help when required—lavish in their encouragement, and complete analysis of the characters with whom they are called upon to deal, eminently fitted them for the high position which they occupy as the heads of our profession. (Cheers.)

Professor SIMONDS said—A man must be made of much sterner metal than himself to be unmoved during the high eulogiums which the President had been pleased to make. If there was one point in which it seemed to do him justice, it was the remarks which had been made as to his onward progress in the profession. He had been in connection with it since boyhood; and if old age and



gray hairs will permit, will see him in it for many years to come. (Cheers.) He had been compelled to look upon this meeting with a great amount of pleasure and pride, as an effort springing from the professional body. The honour done to himself and colleague by the North of England Veterinary Medical Association this day, was unprecedented in the annals of veterinary medicine; for, as far as he was aware, such an honour had never before been done to any two members of the profession, and for such a special mark of esteem, he could not but feel that it deserved his high appreciation. As connected with the Royal Agricultural Society of England, he could express the satisfaction he felt in seeing the great good which accrued to the profession from its operations: it had been immense, and doubtless would continue to be so; going no farther than the prizes which were annually awarded for subjects proposed as essays, the successful competitors had derived the greatest benefit—as invariably they received a greater share of patronage in their locality than before—in consequence of the value placed upon their opinions and ideas, no matter where they came from—this side of the Tweed, or the other side of the Tweed; all, if successful, reaped a profitable share of the reward afterwards. He was glad to see that his Northern friends had not been slow to take advantage of those prizes offered, and would give them every encouragement to proceed in the work before them; and, instead of feeling any animosity towards them, on the contrary, looked upon their graduates with respect and admiration, in having made choice of a high calling, and also as friends and honourable men joined together in one common profession. The formation of these local veterinary medical associations was a source of great satisfaction to him; as they spring up in different parts of the kingdom, the effects of great good must be apparent; and the meeting together of the members of one body, calculated to advance their common interests, as well as social and professional standing. Had it not been for the existence of the North of England Veterinary Medical Association, such a meeting, and in such numbers, as the present could not have taken place. He could not understand how it was that this and similar institutions had been commenced in the North, as in the South scarcely any steps had been taken towards effecting the establishment of such; he could not estimate their qualifications too highly, neither overrate the importance of veterinary surgeons becoming members; and hoped no person present, who was not already a member, would leave the room without enrolling himself as one. (Cheers.) It is as necessary for the veterinary surgeon to keep pace with the tide of progress and development in his profession with as much eagerness as when a student; in fact, he is or should be a student the whole of his life; and a valuable source of information is to be found in meeting with his brother practitioner. The Professor again returned thanks for the honour done to him and his colleague, and sat down amidst great applause.

Professor VARNELL said he felt that he could not express in words the sentiments which he entertained towards the members of the North of England Veterinary Medical Association, for the great and honourable notice of himself and colleague; but, in the absence of words, could feel how much he valued the kind reception which the veterinary surgeons of the North of England had, doubtless with some trouble and inconvenience, resolved to afford them. It is highly gratifying to see such an amalgamation in a border town, and near where there are already three schools of veterinary medicine. Although he might wish to see those schools more united, nevertheless he felt highly gratified at the signs of cordial good fellowship—(cheers)—which existed there, it was a mark of onward progress in the common cause of the profession. He certainly did not anticipate meeting with such numbers when the invitation was received by him, and considered it a great manifestation of the existence of a general feeling of union. The existence of such local societies is a great benefit to the community, and highly creditable to their promoters in these Northern counties for their origin and establishment. Although carried out in the North, the idea was first promulgated in the South, by Mr Raddal of Plymouth; but



how it was that the suggestions and ideas in connection with them have not been acted upon by the Southern veterinary surgeons he was not aware. The influence of these societies are very great as well as varied; and they might be looked upon as great lights diffused throughout the profession, and proved as safeguards to criticise the schools which exist; and it would be well for these associations to set about the task, for they (the teachers) are not perfect, nor do they expect to be. (Applause.) Professor Varnell again returned thanks for the very kind reception afforded by the Society.

Song—Mr E. C. DRAY—"This day a stag must die."

The Vice-President, Mr THOMPSON, in proposing the "Veterinary Profession," said—My impression is, gentlemen, that the veterinary profession is rising in importance, and gradually, although slowly, taking its place side by side with other scientific and liberal professions. I think, in one particular, you will agree with me, that we have represented here a fair specimen of its importance, when the North of England Veterinary Medical Association has seated around its festive board the *elite* of the profession, which body, I feel, is at present represented by men of ability, energy, and industry. I for one believe that if the working members of the veterinary profession, in the daily business and cares of life, remain true to each other—(cheers)—while the professors, teachers, and presidents, are all harmoniously cemented together in one grand principle of progressional development, a glorious future is in the prospect; and I would venture to predict, that the time is not far distant when each member in his turn shall take his stand in the elevated social position to which, as a professional gentleman, he is justly entitled. (Applause.) He (Mr Thomson) would not say more, but give—"The Veterinary Profession," and unite with it, the name of Mr Hunt, President of the Royal College of Veterinary Surgeons.

Mr HUNT thanked the Vice-President and gentlemen of the Society for the marked attention which he had received at their hands. The prosperity of the veterinary profession was a subject dear to all, and claims from its individual members their entire regard; much also depends upon their individual as well as united action. No matter to what extent we legislate, the point desired will not be attained until the profession values and preserves its own respectability; each member should watch over his actions with a very jealous eye, and be determined to fulfil to the letter the duties required from him as a brother practitioner. As provincial veterinary medical associations are originated and carried out immense good will result; the meeting of man with his fellow will tend to bring about a generalization of feeling, and more definite action in the whole body. At present there is too much apathy, too much laxness in the profession, and little if any real interest taken in matters affecting the community at large, and in consequence few members attend the meetings of the profession in Red Lion Square. Members do not come up as they should do. If matters of such weighty importance, which are only to be discussed at the general annual meetings of the corporate body, are thus slighted and neglected, how can it be expected that the general working of its individual parts should preserve that order and arrangement, and give such general satisfaction as might be expected, if a proper amount of enthusiasm and genuine spirit was not exercised and brought to bear. The profession must bear in mind that these meetings were open to all connected with the corporate body, and were for no party purposes, but for the proper administration of the requirements of the profession; there all political questions are open for ventilation and discussion; in fact there was every opportunity afforded to those whose wishes are for the improvement and elevation of the profession. This repeated absence from the meetings, and constant inattention to the interests of the whole body, is a complete injustice to the profession, and much amelioration cannot be expected where so little interest is displayed. As President of the Royal College of Veterinary Surgeons, he felt a great pleasure in representing that body at this meeting, and also the feeling of the College towards the members; and he begged that in future, as the step towards rendering effective



aid in the general progression and advancement, the members should present themselves yearly in the month of May in Red Lion Square, and testify by their presence and voice, &c., the real interest which they felt for the welfare of the whole community. Unless some trouble is taken in such matters there will be no signs of improvement. (Hear, hear, and cheers). He begged to thank the members for the most flattering reception which they had met with, and from the inhabitants of Newcastle generally, from first to last, the kindness on all hands, was extreme and almost embarrassing. (Loud applause.)

Song—Mr H. HUNTER.—“*Nihil Desperandum.*”

Mr ARMATAGE, Hon. Sec., in proposing the next toast said,—I rise with a full conviction of the importance of the task which has been delegated to me, and have to regret that it demands greater justice than is comprised within the capabilities of an individual like myself. It has been frequently said—and doubtless with a great amount of truth—that the veterinary profession was never higher than at the present moment; but it cannot be denied at the same time, that if the hand of improvement were passed over it, a much greater change for the better might be judiciously effected. Talent, as a rule, is not so much encouraged and patronised in our body as it should be. No matter where we look, the wellbeing of our valuable domestic animals in many instances is entrusted to the care of persons without a particle of either respectability or understanding to recommend them, and not in every case by the poor owner, but in far too many by the rich landed proprietor. In this immediate district, although there are qualified veterinary surgeons who, in my opinion are second to none in other parts of the kingdom, there are, nevertheless, hundreds of horses and ponies, especially below ground, left to the merciless judgment of the blacksmith or horsekeeper. (Hear, hear.) Surely if the racer, hunter, carriage horse, or hackney, require the best and most perfect treatment in their more advantageous position, the poor pit-horse and putting pony, under every disadvantage, should have the best skill displayed for his wellbeing and security. (Cheers.) If the science of chemistry is useful for the ends of the “viewer” of the colliery, are there not half-a-dozen others which, in addition, are needed to be thoroughly understood by the veterinary surgeon in his attendance on his patients. Surely if the man without education and qualification is worth employing for the treatment of their ailments, it must be worth infinitely more to the owner to engage a thoroughly educated man, whose efforts would be naturally directed towards the prevention of those diseases,—at all times a more profitable proceeding than the cure of them. (Hear, hear.) I look upon these provincial veterinary medical associations, gentlemen, as one of those great beacons which have been ignited, and now indicating by its powerful flame that eminence to which we as a body are wending our way, and a distinguishing mark by which our profession may be known; and young as this Association is, its origin and purpose have not been without effect. The public, that far-seeing and discriminate body, have throughout looked upon the veterinary community as a disunited class of men; if one has not given satisfaction they immediately call in another, and in this manner the self-respect of an individual has often been sacrificed by a supposed honour in the preference and attention; he shows there is no confidence between himself and brother practitioner, and the selfish employer turns it to his own account. Let the veterinary surgeon testify to his having a respect for himself and brother practitioner, and the public will find beneath his acts motives which must claim for him the greatest consideration. I have frequently witnessed the good effects of that union, so much desired in other parts, which exists in the flourishing city of Manchester; and we see it manifesting itself, and nestling as it were under the wings of the veterinary medical associations of that place, in Glasgow and Leeds; and I am proud to say, we have not been insensible to its invigorating influences in the town and district of Newcastle-upon-Tyne. (Cheers.) Of Manchester I have often heard it said, “If you get one of the Vets. there to make any proposition, depend upon it not only will it be on the



strongest reasonable foundation, but to a man will they carry it out." (Cheers.) This is the sort of union we want, unity of heart, unity of purpose and design; not unity of opinion merely, but union of principle. Men accomplish the same ends by a variety of ways. Let the veterinary surgeon look to this principle, and be "A man for a' that." (Cheers.) Diversity of opinion will occur, but it is only by contact of man with his fellow that its proper tendency will be observed, and association acts as the levelling principle to the veterinary surgeon; its tendency is to show up a man in his true colours, to cause him to extend the right hand of fellowship, and no longer go on hating or envying his neighbour, without knowing why. Association also stimulates the operations of the mind, and developes ideas which otherwise would be lost or never arrive at maturity. Although I look upon the aged and practical man with an innate kind of reverence, yet I value the principles of sound science and correct investigation; the mere practical man waits for results, whilst the well balanced mind, thoroughly trained in the process of events, their nature and bearings, acts by anticipation and induction, which, with practical details, are the handbook and guide to future honour and emolument. (Hear, hear.) I will not detain you longer, gentlemen, but propose the Provincial Veterinary Medical Associations, coupling with the toast the names of those gentlemen whose eminence in the professional community fully entitle them to the distinguished position which they now hold as presidents of the respective societies of Yorkshire and Manchester,—Messrs Dray and Greaves. (Loud applause.)

Mr E. C. DRAY, Leeds, in the course of some well-timed and humorous remarks, said he valued the principles of veterinary medical associations, and felt more and more the necessity for a perfect unity in the brotherhood. If the veterinary surgeon will but render that effective assistance in carrying out their design, their influence must inevitably be that of mutual good. The necessity of a spirit of co-operation exists always, and the more the practitioner replies to that necessity, the more effective member of his profession will he become, and the greater will be the impetus with which he must urge on the machine of the science. In his dealings with the public, there exists a great degree of necessity for each practitioner to be not only on "good terms" with his brother, but there should exist that mutual good feeling and desire for each others' welfare and benefit, that, when a misunderstanding takes place between his client and himself, he can call in the aid of his fellow to smooth down the path of difficulties. Mr Dray gave the details of a case in which he was called in to endeavour to maintain the standing of a brother practitioner against a client, who had resolved to enter an action for alleged want of skill in treating his horse, which had died, and stated, that after a *post-mortem* examination had been made, the owner, who before was all storm and passion, now became convinced of his mistake, and not only offered the most ample and sincere apologies, but, sensible of the respect and good understanding which he saw existed between the professional friends, insisted upon their accepting of the best his house could afford. (Cheers.) He, Mr Dray, felt sorry there was not more of this co-operation amongst the brethren; it is a result of great apathy and sluggishness of action. Many there are in the profession who are entirely ignorant of what passes in the veterinary world. He knew well a veterinary surgeon, at the present time, in one of the largest towns in the county of Yorkshire, who is neither a member of a veterinary medical association, nor does he take in a periodical in connection with his profession. He had a great desire to see the advancement of the profession and promotion of the veterinary surgeon—that is, necessary promotion, for such might go on too far; his ideas were not so extensive as to create nobility from the ranks of the profession. This reminded him of a saying reported of George IV., who was never remarkable for having said many witty things; but on this occasion, when asked to make Sir Astley Cooper a lord, replied, "Why, then, we shall have all the ladies crying 'Good Lord deliver us.'" (Cheers and laughter.) The veterinary surgeon, in every



aspect, fills a most responsible position, and his office and nature of the calling he follows are quite incompatible with apathy and indifference.

Mr THOMAS GREAVES, Manchester, said,—Mr Chairman and Gentlemen—If there is one circumstance in connection with this my visit to your town and association that is not wholly destitute of even a particle of regret, it is in this simple incident, that the responding to this most interesting toast—viz., “The Provincial Veterinary Medical Associations,”—should not have fallen into the hands of a better and abler man, to have done full justice to so important and interesting a subject. (Cheers.) The veterinary profession, headed as it is by colleges which are the pride and glory of the land; colleges conducted by professors who are an honour to the exalted positions they occupy; add to this the movement that has recently taken place in the provinces; the deep interest which has been excited in the body of the profession throughout the length and breadth of the land by these associations. I say, with a full knowledge of all these facts before us, who can doubt the great good that must result, not only to our own profession specially, but to society at large? It is a simple rule-of-three question, when we have a greater number of intellects at work, we must have greater results; and let me ask, can there be anything more grand or noble than the spectacle of a great intellect grappling with a great difficulty? We have heard a great deal about manly occupations; can there be, I would ask again, anything more truly manly than in associating together and exercising the best abilities God has given us in mitigating the “ills that flesh is heir to,”—in ameliorating and circumscribing the evils engendered by civilisation? (Hear, hear.) What nobler occupation can be conceived than in employing one’s best abilities in tasks such as have been laid before us this afternoon—in checking the ravages and circumscribing the area of various contagious and destructive pestilences? Meetings of this kind must have their effect; they give us a feeling “like unto giants refreshed with wine,” and an increased determination to go forth and do something worthy of the noble profession to which we belong. (Cheers.) In my own city, one of our ablest and most experienced men, Mr Lawson, has, in a most laudable manner, undertaken to bring into our (Lancashire) association the subject of Tetanus. He has devoted much of his time and mind to it, and now adopts a method by which he has *cured eight out of ten cases*. His son, too, has devoted much of his time and mind to another disease hitherto considered all but incurable—I allude to Cancer; and has successfully cured two out of three cases from amongst the very worst description I have ever seen, and the third is now on the highway to recovery. I allude to these in order to illustrate the great value of association, and feel no doubt but they have stimulated thought and contributed to these results; and the method adopted will, I have no hesitation in saying, be nobly and freely given to the profession. Then, as to contagious diseases, I am apprehensive that I shall be unable to contribute any knowledge upon this great and important subject, perhaps the most important veterinary question that can engage the mind of man. Situated as I am in one of the largest cities in the kingdom, where rot in sheep is unknown, where pleuro is only occasionally seen, my opportunities have been limited; but limited as have been my means of observation, I have nevertheless paid some attention to this disease, and I am rejoiced to see so many practical men met together, to make a collective effort in order to devise some means whereby its dreadful effects may be, in some measure at least, mitigated. The question is no fiction; although it may have been somewhat over-coloured in some quarters, it is nevertheless a very weighty and important question to study; and it is the duty of every man to do all he can to circumscribe its area as much as possible. If some historian or romance writer, some man of a high order of intellect, were to take it into his head to make this subject the theme for his pen, I can easily imagine him drawing something like the following picture:—“At a certain period of the history of a great nation, in the midst of its greatest state of prosperity, it was visited with a most destructive pestilence, which smote the flocks and herds; so wide-spread were



the ravages of this pestilence, that not only were the agricultural classes of that nation, but those also of surrounding nations, reduced in numberless instances to penury and ruin; everything that science and skill could suggest was done to check its fatal progress; the government and many scientific bodies in each nation strained every nerve in vain, the disease went on with more or less malignity for twenty or twenty-four years. Mankind mourned at this state of things, and seemed disposed to murmur; but about this time certain bodies of daring, earnest men, conceiving it to be their peculiar province, and who, goaded on by the pressing emergency of the case, and stimulated by public opinion, having collected all the knowledge and skill possible from past experience, took council together, and their understandings were greatly enlightened; they devised certain methods which led to a better management of all contagious diseases, and which in the end resulted in entire success, by which the agricultural classes and entire nation were benefited in a degree that was wholly unprecedented." Gentlemen, one portion of the picture is already distinct before our eyes, and it is for us to fill in the remainder. The essay we have heard read has very greatly advanced that painting; the remarks that have been so well made by other eminent and able speakers bring the picture still nearer to perfection. I would to God it was in my power, and that any remarks of mine could put the finishing touches to it, so that it could stand out conspicuously before us, and we could say, "it is finished, the task is accomplished, we can limit and circumscribe all contagious diseases." But, gentlemen, we have not yet achieved this; one thing, however, is certain, viz., that this meeting and this discussion cannot fail to awaken deep thought in the minds of all men concerned; and I hope and trust will produce a great improvement in the knowledge and management of these perplexing and dangerous diseases, especially advancing that kind of knowledge of controlling and confining their subtle and dangerous disseminating tendencies. (Cheers, and hear, hear.)

Song—Mr G. ARMATAGE—"Trouble your heads with your own affairs."

Mr DUDGEON, Sunderland, proposed the "Veterinary Colleges" north of the Tweed, and in eulogistic terms spoke of the valued assistance which had been rendered to the profession by the exertions of Professor Dick, whom he was sorry was not present, and the influence of the Clyde Street School, as emanating through the teachers. He also touchingly alluded to the great loss which had been sustained by the profession, in the death of Mr Barlow, one of its brightest ornaments—to the student, a father, friend, and teacher—and to the world a philosopher. To have passed one's noviciate under him, was alike an honour and a privilege, and he would exclaim with Byron:—

"Oh! what a noble heart was here undone,  
When science self-destroyed her favourite son!  
Yes; she too much indulged thy fond pursuit,  
She sowed the seed, but death has reaped the fruit."

Of Professor Gamgee he (Mr Dudgeon) knew but little personally, but felt that he had one grand object in view, viz., the elevation and advancement of the profession. (Hear, hear.) He read his writings, and looked upon them with great consideration; and though not always thinking alike with the Professor, he thought no one could deny those writings emanated from a scholar and a gentleman. (Cheers.)

Professor GAMGEE returned thanks, and in reviewing the history of Veterinary Medicine north of the Tweed, said, "he looked back with great pride and satisfaction upon the great work which had already been accomplished in so short a time; but the consideration should by no means weigh against that which in future must be effected, when the interests of the general body of the profession is concerned; much has doubtless been done, but more has yet to be done; and it would be his high aim to watch over the peculiar interests of the profession,—his motto was, "Forwards" and "Onwards;" and if in the interests of the profession he were called upon to do anything, he would be no obstruction or hindrance, but rather a helpmate and assistant. As we take our stand



in the order of changes and events, it may be second, but we shall endeavour to be first; and such is our desire for the welfare of all concerned, that at any time, if any member can point out any method by which an improvement can be made in the present curriculum, with a view of turning out improved veterinary surgeons, they will not have a deaf ear at the New Veterinary College, Lothian Road, Edinburgh. He felt that it was highly necessary that something should be done in the shape of improvement in the system of remuneration, so as to secure the admission of first-class men into the profession; it could not be expected that great men would enter a community whose services were so poorly remunerated. It was a disgrace to a profession, and so long as men were so poorly recognised and valued in one of the noblest pursuits, we cannot expect that talent will be on the increase. What can be said of the remuneration to practitioners, can be also said of teachers; and with shame be it said, one of the greatest lights and ornaments in the profession, now no more, an authority on all scientific matters, was in receipt of only L.100 a year. One other point which deserved attention, he thought was the college fees; he had often heard it remarked, that those of the London College were twenty-five guineas, a sum too large; for his own part, he would have them fifty guineas, and thus secure the entry of persons of a superior class. (Hear, hear.)

Mr H. E. WILKINSON next proposed "The Editors of the Veterinary Journals;" and observed, "that he considered the sentiments of the profession were well represented in the recognised Journals of the body; were it not for these Journals we should not have the glowing elocution of Professor Gamgee, the calm logic of his old teacher, Professor Simonds, or those scientific emanations from the pen of Professor Varnell." (Cheers.)

Professor SIMONDS said—The interests of the journals consist as much in the contributors as in the editors, and as much, if not more, actually depends upon the latter for the success and welfare of the undertaking; they are mainly and essentially the journals of the profession, not the journals of the editors. He (Professor Simonds) thought with Professor Morton, that if veterinary surgeons would write essays on given subjects, it would enhance the position of the profession. Mere details of cases were not sufficient, but the ideas and opinions of persons in reference to diseases, &c., were to be courted, and all should endeavour to contribute, no matter if their subject should occupy but six lines, so long as it consisted of purity of thought, and was in accordance with the strict principles of science; nor whether it came north or south of the Tweed—equal attention should be paid to all, if in furtherance of veterinary knowledge. He could only add that the journals were at the service of the profession, which they could use as they liked, without minding the space; they (the editors) were in a position to afford almost any amount of space, and that without any additional cost in the price of publication. The "Veterinarian" now finds its way to India, China, America, and most of the colonies, to distant friends in the profession, and proves a valuable medium for the preservation of the transactions of such societies as the West of England Veterinary Medical Association, as well as Record of Practice, &c. &c. He would give his contributors—many of whom he could recognise present—every encouragement to forward all they could, and thus add to the general information upon the science.

Professor GAMGEE also urged upon the members the great importance of contributions being forwarded for publication after the manner of "Youatt." Veterinary surgeons should write more upon subjects of a special character, and work into the hands of those connected with the press, as by its influence much good can be accomplished. He valued the powerful influence of the press and its connection with the compilation of veterinary literature. Well might we profit by the acts of Professor Morton, who had done more than any other man for the profession in that respect. He (Professor Gamgee) would call upon all present to drink a bumper to the health of Professor Morton. (Cheers.)

Professor SIMONDS briefly but eloquently returned thanks on behalf of Professor Morton.



Mr JAMES FAIRBAIRN, Alnwick, proposed the visitors, and said, however much they might be gratified in meeting with their professional brethren at these times, it was a matter for rejoicing when gentlemen—distinguished strangers—from great distances, did them the honour of attending their meetings; it was very satisfactory to know that there were gentlemen who took an interest in the profession and its advancement. (Loud cheers.)

Mr M'KENNA, Belfast, replied—If he had come for no other purpose than to meet his friends on this occasion, he could not receive a greater honour than the privilege of meeting with them under such very favourable circumstances. He certainly did not consider that there would be such a meeting when he received the invitation, nor did he believe the profession could be drawn together in such numbers. When his friend and old pupil, Mr Wilkinson, wrote to him, he declined on the score of business. However, a second letter came, stating in peremptory terms—"You must come, for Simonds is coming, and Varnell is coming, and a first-rate meeting is expected." At the moment he received this intimation, his horse and gig were at the door, and the steamer ready to sail; so he at once ordered back the former, and took the latter for England, saying within himself, he should be proud to meet such persons. He felt there was need of many meetings of this nature, and their influence needed also in bringing about a state of unity in the profession, especially with reference to those instances where a practitioner felt his reputation to be at stake. Mr M'Kenna detailed one or two instances where the character of a veterinary surgeon would have been ruined, and his future prospects blighted, had it not been for the friendly assistance of professional neighbours. (Hear, hear.)

Mr CUBITT, Bacton Abbey, North Walsham, Norfolk, said, he should be wanting in courtesy not to return thanks for the compliment paid him as one of the visitors, and for the kind welcome received. He was not a member of the profession, but, as a practical farmer, felt a deep interest in all that pertained to it, more especially with regard to its future progress and development. He had listened with pleasure to what had fallen from preceding speakers. All seemed to agree that the veterinary profession did not take that eminent standing to which it is entitled, nor did he consider so desirable an object could be obtained till a higher standard of education was introduced, and the college examinations embraced a wider range. In looking over the register of the Royal College of Veterinary Surgeons, he was surprised to find so important a county as Northumberland so badly represented; it did not say much for the general intelligence of the farmers to find them entrusting the lives of their valuable animals in the hands of farriers, cowfeeders, and other unqualified men, who generally managed to kill more than they cured. He knew a case in point, in which the lives of some valuable draught horses were destroyed by one of these quacks. The animals were suffering from an unusually severe attack of influenza. The old remedy, bleeding and purging, was resorted to, followed, as might be expected, by utter prostration and ultimate death. No doubt many valuable animals were still destroyed by unskilful and injudicious treatment. This class of men was happily disappearing from the southern counties; and when farmers really knew the importance of veterinary science as applied to physiology, they would cease to employ these cow-leeches or veterinary quacks. There was a wide field open to the educated and skilled veterinary surgeon; one important subject to which he might with profit turn his attention, was that of "cattle food." The ever-increasing demand for meat necessitates an enormous consumption of artificial food. The farmer was subject to the greatest fraud, indeed too often became the victim of unprincipled men. How great would be the advantage to have within his reach the scientific veterinary practitioner, who could analyse that food, and direct him in its proper application. The chairman, Mr Hunting, had published a valuable pamphlet on the principles and economy of horse-feeding; it should be read by all interested in cattle feeding; he (Mr Cubitt) had, as an individual, profited by its perusal, and thought this a fitting opportunity to thank Mr Hunting for such valuable information. He agreed with



the professors that these matters were not sufficiently ventilated. It was a pity that men so advanced in their profession should hide their light under a bushel. It could only be from a comparing of notes, and from a well kept record of what had happened in the veterinary sphere, that the profession could hope to reach the pinnacle of success they were tardily approaching. He could not resume his seat without a passing remark on what had fallen from Mr Stephenson, who expressed a hope that the strangers visiting the town had been treated with kindness, and gratified with what they saw; for his own part, he must beg to say, that he had met with the greatest civility, all seemed to vie with each other, from the gentlemen at the head of those vast factories to the humble mechanic, in their desire to show and explain those wonderful engineering sights on the banks of the Tyne. In going over such works as Stephenson's and Hawthorn's, as also Palmer Brothers, at Yarrow, he could not but feel a wish that those people, bred and born in the more isolated districts of the kingdom, with cramped views and narrow minds, would come here and see what is going on *in the world* and *for the world*. Who could witness the progress of those beautiful engines, many to go abroad, destined to open out the resources of foreign lands, and the building of those magnificent iron ships, without contemplating the probable great and noble results, as tending to the spread of civilisation, and adding to the prosperity of the human race. Mr Cubitt concluded, by again thanking Mr Fairbairn for the honour of having his name coupled with the toast of the visitors; and trusted, if such meetings of the profession should become more frequent, they would not fail to have the desired effect.

Professor GAMGEE, proposed, "The President," and spoke of him not only as a gentleman, but as a successful practitioner; one who tested men by a peculiar gauge, and in proportion to their willingness and capabilities for good works. He had known him for many years as a friend and brother professional, and considered him, from his high professional attainments, eminently calculated to fill the honourable post of President of the North of England Veterinary Medical Association. (Applause.)

Mr HUNTING, in reply, stated that nothing inspired him with greater delight than to meet his friends in the profession; he had a great desire for the mutual good of the body, and entertained a high respect and admiration for all who had the courage to make sacrifices for it. He had the greatest satisfaction in being able to recognise in his immediate professional neighbours, friends of upright, honest, and firm principles, men of unflinching zeal, hard workers in their professional avocations—men of determined purpose and scientific ability. He had known some of them for a considerable period, and felt that in Wilkinson, Scott, Thomson, and others, he was as well positioned for sincere attachment as man can boast of. He had always been a hard worker himself, and his paramount object was to make himself generally useful to all in the profession, and render himself worthy of his employer's notice and esteem. He had met with many friends, and had very great reason to value their assistance, and hoped never to forget their good opinions. As for the post he occupied, of President of the Society, no one knew his own failings better than himself, and he felt convinced that others more qualified could have been found to fulfil those important duties; but however feeble his efforts may have been, they cannot be exceeded in sincerity. Mr Hunting begged to thank Professor Gamgee and all present for the honour which had been conferred upon him, and assured the Society that, during his tenure of office, and in whatever capacity he might stand in relation to the Society, so impressed had he been of its real value to the profession, it should always receive his first and most important consideration. (Cheers.)

Professor VARNELL next proposed "The Vice-Presidents," whom he stated to be men of well-known ability and usefulness in their professional capacity, and in their private sphere possessed the confidence of all who had the pleasure of their acquaintance, and did honour to the Society with which they were connected. (Loud applause.)



Mr THOMSON said he felt at a loss how to shape his course of reply after such flattering eulogiums as had fallen from Professor Varnell; if he were useful in his profession, he felt he was pursuing a path of duty which should be the first thought of the veterinary-surgeon towards his employers. If his private worth was such as to merit for him the good feelings and opinions of those around him, he might say he had accomplished much of which he felt extremely happy, and as far as his humble assistance is concerned, and as one of the Vice-Presidents of the Society, he should never be found wanting when the call of duty sounded on behalf of his brother practitioners. (Cheers, and hear, hear.)

Mr H. E. WILKINSON, with unsurpassed brevity and neatness of speech, said, he felt the proudest satisfaction in being one of the Vice-Presidents of a useful Society, and that in countenancing the efforts of the general body, a noble result must be expected. (Loud cheering.) As an inhabitant of Newcastle, he begged to offer a cordial welcome to all who had been induced to visit the town by the meeting of the Royal Agricultural Society held there; probably they would not find the district equal to those of the south, nor the mannerisms of the northerners so easy and refined; but under all there is a cordial hospitality which flows from hearts most sincere, enveloped as they are by such a rough exterior. He begged that when his friends were tired of the sun and heat of the south, they would again pay a visit to the pitmen of the north. (Loud laughter and cheers.)

The PRESIDENT said he should feel he had neglected an important duty if he did not endeavour to pass some tribute of regard for the exertions of their Hon. Secretary, Mr G. Armatage. Societies of a public or private character have great need of a prime agent, one upon whom rests the responsibilities of the whole concern, and one capable of taking upon himself duties of a most arduous character. The energy and clearness which Mr Armatage had displayed, not only in carrying out the wishes and objects of the Society, but the principles of its formation—for it must be known its origin is entirely due to him—eminently characterised him as a most efficient officer, and one calculated to do honour to the profession to which he belongs. He must confess, that when he (Mr Armatage) first intimated to him his desire for the formation of the Society, he saw no great probability of its commencement or establishment, but Mr Armatage, nothing daunted, pursued his course, wrote letter after letter, to which he never received replies in many instances. Still, however, he went on; and, not satisfied with negative replies, or silence towards his letters, next travelled miles to pay a personal visit, and win over by his persuasive eloquence. Such is the character for perseverance of the Honourable Secretary. To him alone must be awarded the merit of having successfully carried out the formation and working of this Society, and to him all must feel indebted for the present meeting. If this Society had not been in existence, it is very doubtful if this dinner had taken place. (Great applause.)

Mr ARMATAGE, in reply said,—“If there are some circumstances of greater embarrassment than others, they are those in which a person is called upon to make a response to such flattering sentiments as had fallen from the respected President in recognition of his services as Hon. Secretary of the Society. True, he had been conspicuous in its formation; but he felt the establishment of such a Society would fulfil an important omission in the profession, and perform a means of public good. He was desirous of seeing his brethren upon a different footing, consistent with men of education, standing, and the spread of knowledge. True, he had met with obstacles in his progress, and the President presented himself as one on the first interview; but he was determined not to allow even the opinions of Mr Hunting, or any one else, to weigh against the necessity of doing good; and felt, like Napoleon, that he would not believe in failures. ‘Impossible!’ cried that great general, ‘I have no such word in my dictionary.’ He felt also there was a great deal to be accomplished by promptitude of action. When Sir Colin Campbell was asked when he could set out to take charge of the Indian army, he replied, ‘To-morrow,’ as an earnest of his future



success; and to these principles alone had he attributed the success of the Society—dawdling will not do in such matters. If you cannot be received at the front door, you must attack your man through the back; but determination of purpose must not be overlooked. The only thing which gave him (Mr Armatage) annoyance was the great neglect and apathy which exist among his professional friends, especially as regards a letter. Many of the members in various parts of Durham and Northumberland, to whom he had written half-a-dozen letters each, had not yet even deigned a reply—a fact which did not weigh much in favour of their general intelligence. If they are so slow at letter-writing, their means of obtaining further improvement must be as limited. While he felt the proudest satisfaction in the numerical strength of the meeting, yet some degree of sluggishness existed in the members of the neighbouring districts, when the various towns adjoining were considered; from the number of practitioners who were not present, it must be apparent that a great defect existed in the aspect which should characterise the general body. When such towns as Durham, Stockton, Bishop-Auckland, Hartlepool, &c. &c., are not represented on this important occasion, and we have gentlemen present who have thought it no trouble, nor grudged the expense, of coming two hundred miles and more, we certainly cannot say that the pluck of the veterinary community exists in these northern regions so much as it should. He thanked the President and gentlemen present for the great honour conferred upon him, and assured the Society that his utmost endeavours for its promotion and welfare should always be exercised by him. It was a labour of love, and he delighted in being of service to his profession.” (Hear, hear, and cheers.)

Mr E. C. DRAÿ next, in a very neat speech, proposed “The Ladies,” quoting the lines of Sir Walter Scott,

“O woman! in our hours of ease,  
Uncertain, coy, and hard to please,  
And variable as the shade  
By the light quivering aspen made;  
When pain and anguish wring the brow,  
A ministering angel thou.”

Mr H. HUNTER briefly replied.

And thus ended one of the most interesting and agreeable gatherings of the veterinary profession which was ever known.

The North of England Veterinary Medical Association has instituted a precedent which the profession will do well to follow—that where practicable, and under similarly available circumstances, it must give a great impetus to our social and moral standing, if the members were called together for the purpose of taking up subjects of interest connected with their general welfare and profession. Such societies have great influence, and by their united exertions may accomplish much for the general good.

---

## PERISCOPE.

---

### A FEW WORDS UPON RACE-HORSES.

TO THE EDITOR OF “THE TIMES.”

SIR,—Writing the results of my life’s practice upon horse-breeding, at the request of the Right Hon. John Evelyn Denison, I strenuously avoided touching the race-horse and racing, except so far as the horses used every day by everybody were affected, and hoped to have avoided everything like controversy upon turf matters. But, looking at the vast importance of the subject, I rather rejoice that a controversy has arisen, feeling that the more the truth is controverted

the clearer it will appear, and hoping that a remedy will be adopted before we find our cavalry are destroyed for want of being better mounted.

I stated, and do not hesitate to state again, that our thoroughbred horses are seriously deteriorated in size and substance since the peace was made in 1815. General Peel and Admiral Rous deny this, and I wish to make a few remarks in reply to their statements.

Mr P. Wyndham brought a motion into the House of Commons to withdraw her Majesty's Plates from the turf, to which General Peel replied in these words, "That objection is taken to the racing of two year-olds, and what is proposed? Why, to do away with all the races for old horses, all the weight for age races, and to abolish the Queen's Plates. I say," said General Peel, "it is impossible to tell to what degree these Queen's Plates encourage the breed of horses. You cannot judge of it at all by the number of horses that run for them. After horses have passed their third year a man is inclined to ask, 'What can I do with them?' 'Oh,' he thinks, 'I can race them for Queen's Plates.' And this attaches a value to these horses which otherwise they would not possess, and without which they might go out of the country." Now, I agree perfectly with General Peel in all this, and do not desire a better advocate to show the value of the changes I have proposed. I advocate strenuously a larger number of Plates to be given by his Royal Highness the Prince of Wales, weight for age races, the old style of higher weights and longer distances than at present, without heats.

General Peel mentioned the grand show of horses then about to take place in London, at which there was to have been such a display as to convince the members that no improvement is required.

That show has passed, and although there were many neat, handsome, light horses shown, there was not one heavy cavalry-officer's horse entered for the prize. What would not a fine strong horse have been sold for, if any dealer could have produced one?

Then it seems General Peel's test has failed him, and I have thought he had some little misgiving of the value of his opinion about horses not being deteriorated, for he said, "So far from the breed of horses having fallen off, I believe there never was a time when thoroughbred horses were more surely going back to that size and power which formerly distinguished them." They were, then, formerly distinguished for size and power, and are now surely going back to it again; and yet General Peel tells us that no deterioration has taken place.

I should desire no better evidence than this to obtain a verdict from a jury of my countrymen to establish the entire substance of my paper, that thoroughbred horses are deteriorated in size and substance.

Admiral Rous states in "The Times" of June 29 last, that there is but one opinion among persons interested in the turf, that the grand object in breeding is to combine good size, great strength, and power of endurance, with superior speed.

I agree it ought to be so, and it was so in the north of England, in Scotland, and in Ireland forty years since, where horses carried weight for age, and ran two, three, or four mile races. Mile races were then the exceptions.

Newmarket at that time was notorious for small, lathy horses, fit only for mile courses. I once went there intending to buy, and was so astonished at the difference in substance between them and the north-country horses that I did not make an offer for a single horse, and never went there again. I hardly ever went a journey into the north upon the same errand without buying horses that could win plates, gold cups, and King's Plates, and never had a horse break down in a King's Plate race. If 10 st 4lb. be put upon a four-year-old that can carry only 7 st. 7lb. he must break down.

I am glad to hear there are some horses of a more useful kind at Newmarket now; it may be the starting point of better things to come.

The Earl of Glasgow, who is a north-country man, knows very well the difference between useful and useless; forty years ago he was a first-rate sportsman in the north of England, and received a good education there among the



useful. The celebrated Baron who owns the other fine stud mentioned has been well tutored in the first city in the world to make the same distinction.

The deterioration in the size and substance during the last forty or fifty years must be ascribed to the real cause. It is this:—About 210 races are run annually at Newmarket, besides matches; 108 of them are five, six, or seven furlongs each, fifty-eight for one mile, twenty-three one and a half miles, twelve two miles, six three miles; three of which are Queen's Plates, and only three four-mile races in the year. Sixty-nine of these 210 races are handicaps, prizes for bad horses (to say nothing of the influence upon men), while only nine races are run in the whole year above two miles, three of which are for prizes given by her Majesty.

What does Newmarket do to improve the size, substance, and endurance of race-horses? Nothing. Newmarket ought to have increased the speed by these 164 races in the year from five furlongs to a mile, but I think it has not.

Hambletonian and Diamond ran over the Beacon course (4 miles 1 furlong 172 yards) in 7 min. 15 sec.; Isoline took 8 min. 10 sec. to go over the same course. Macaroni took 2 min. 50½ sec. to win the Derby (1½ mile) with 8 stone 10 lb. up. Macaroni's rate for the Derby, if it could have been continued for 4 miles 1 furlong 172 yards, would have been 8 min. 15 sec. Hambletonian's time for the Derby at the Beacon-Course rate would have been 2 min. 30½ sec.

Harkaway won the Goodwood Cup in 1839 in 4 min. 58 sec. Isoline, with Buckstone, in the race in 1863, took 5 min. and 7 sec. Do these records show that the speed is increased? Certainly not; just the reverse.

Admiral Rous says we have enough left to challenge all the world. The boast is very much out of place just now, when we have lost the Oaks to a French mare, and our Derby winner has been to France and been beaten by a French horse. I think we had better boast less, and breed some stouter horses that can get two or three miles with weight for age. Have we yet to learn that countries that can grow grapes in the open air to perfection can breed stouter and better horses than those countries that cannot? If I were to state that the best race-horses at Newmarket are French, I do not think I should be far from the truth.

Stockwell and King Tom, and the prices they command, afford a proof of the great scarcity of their kind. So it is with her Majesty's yearlings; they are bred from size and substance, as well as first-rate blood. It is the scarcity that makes high prices. Abundance reduces them.

Admiral Rous says, "The payer of the piper should order the tune." I think so too. Newmarket men have a right to order their races as they please. They want sport, and they want betting; they make their game accordingly, and get both. But the nation must take care of the national interest in the same way; when it pays the piper it may claim a voice in the selection of the tune. Large sums of money should not be sent to Newmarket to be swallowed up with two races, but should be distributed among the counties which contribute to pay them. By this method the object of improving the size and substance of our horses throughout the country will be effected; it will not be effected by two great races in the year at Newmarket.

Admiral Rous admits that "horses famed for running long distances are scarce, because the game is so seldom played." Then, I say, let it be played more frequently, and we shall find such horses as Mahratta, that carried the Admiral, 17 stone, four miles in eleven minutes, winning these races with twelve stone upon them four miles without breaking down; and they will remain as aged horses in the country, getting large, powerful active horses, fit to carry men after hounds, and her Majesty's cavalry into action.

What is the use of the little active horses commended by Admiral Rous, that could beat Mahratta with 7 st. 7 lb. up? We have no men in the army that can ride 7 st. 7 lb. with their accoutrements, nor 12 st. 7 lb. either; our Life Guards and Blues ride from 18 st. to 22 st. each. We can find jockeys to ride 7 st. 7 lb., but we must be prepared to fight our opponents in the field of battle with men who ride from 14 st. to 22 st. each.

I do not think I could have found two better witnesses to establish my statement than General Peel and Admiral Rous; notwithstanding I will add to their evidence the result of the Royal Agricultural Society's show at Newcastle, and the testimony of a practical man who has won more great races than any one, and has seen all the first-rate race-horses of the last fifty years.

The "North British Agriculturist" reports the horse show at Newcastle, to which the Royal Society gave L.800 in prizes (L.100 of which was a prize for the best thoroughbred horse to improve the breed, L.25 for the second), and states "that since the exhibition at Battersea and Worcester, there is a considerable falling off among the eleven thoroughbred competitors for these two prizes; that the two prize horses were not equal to Ellington and Neville, and that the others were weak and weedy, wanting in size, substance, and action."

I shall conclude with the testimony of Mr John Scott, of Whitewall House, Malton, whose opinion I have consulted since Admiral Rous declared the deterioration a pure fiction, whose authority I consider the best, and to whose judgment I should willingly have submitted, thinking, in growing old, I might have forgotten the past and not have learned the present.

Mr John Scott says he is of opinion that the English race-horse has not improved since the days of Catton, Philho da Puta, Blacklock, Ebor, and others of their time; he certainly considers the horses of those days were infinitely superior in substance to those of the present day. They were much better shaped horses, on shorter legs and with better substance. Those of the present day are perhaps as tall or taller, but more leggy. They may, perhaps, be as fast for a short distance, but for gameness and endurance are not fit to be mentioned on the same day.

WILLIAM DICKINSON.

New Park, Lymington, Hants, Aug. 11.

## COMPARATIVE VALUE OF THE DIFFERENT GRASSES.

By ARCHIBALD STURROCK, Kilmarnock.

(Continued from p. 448.)

(From the Journal of Agriculture, July 1864.)

### CRESTED DOGSTAIL GRASS.

(*Cynosurus cristatus*, of the tribe *Festucaceæ*.)

PANICLE spike-like, from 1 to 1½ inches or more in length; spikelets of three to five florets, each spikelet having a deeply-cut or pectinated leaf attached to its base, termed an involucre, and the spikelets and involucre all directed to one side of the rachis, which is from that cause hidden on one side and visible on the other; root fibrous and perennial. This indigenous pasture-grass possesses a very ample range of adaptation for different kinds of soils, growing naturally both on dry sands and on wet clayish land, and also making luxuriant growths under irrigation. Its fibrous roots penetrate to a considerable depth, which enables the herbage to withstand a long continuance of hot dry weather. The culms grow to a height of 12 to 18 inches, and on wet meadows even 2 feet; they are thin, hard, and wiry, and are little if ever grazed by cattle, from which cause they may be seen on even heavily-stocked pastures, with their spikes full of ripened seeds, standing untouched during the autumn months; and, from the seeds thus falling into the soil year after year, the crested dogstail is found on many lands naturally by much far too predominant. The root-leaves, however, are relished and eaten by cattle, especially so by sheep, and though small and fine, are produced in comparative profusion.

The crested dogstail, on account of the comparative small bulk of its produce, is by no means well suited for hay crops on the generality of soils; it is



chiefly as a pasturage grass that it can be recommended, and particularly so for sheep pasture on dry lightish soils of rather high altitude. It ought never to form more than a *small* ingredient in any pasture intended to be grazed by oxen, cows, or horses, alone. From the fine, short, close sward, formed by the root-leaves, this grass is specially adapted to sow down bowling-greens and lawns as the main ingredient; and from the same property, a few of its seeds are desirable in sowing down irrigated meadows, as forming a close bottom to the hay. The dogstail is found not to thrive very well on chalky or calcareous soils. It is found to be inferior in nutritiousness to the ryegrass, and less also as regards bulk for hay, but from the abundance of its root-leaves it is much superior for pasture. The seeds are small, with a very short point or awn, and ripen from the beginning till the second week in August; good seeds weigh heavy, about 25 lb. per bushel, and rate, on an average, from 10d. to 1s. per lb. If a culm of this grass is pulled in a green state, the spike-like panicle, during the process of drying, is found to curve or curl round, and to have then some resemblance to a sheep or collie dog's tail—hence its name.

There is one other species of dogstail indigenous to Britain, viz., the *C. echinatus*—rough dogstail grass—but it is very rare, and of no known agricultural value.

The *Sesleria cærulea*—blue moor-grass—was formerly placed by some botanists in the genus *Cynosurus*, under the name of *C. cæruleus*. This grass is plentiful on some of our Highland hills, having a bare stem of 9 inches to a foot, topped with a short, oval, bluish-purple raceme, and producing a *little* herbage which may occasionally take the edge off the teeth of a hungry sheep—otherwise, it is not of the least value to farmers.

#### FIBROUS-ROOTED, TALL, OAT-LIKE, SOFT-GRASS.

(*Arrhenatherum avenaceum*, of the tribe *Avenaceæ*.)

Known also as *Avena elatior*, and *Holcus avenaceus*. Panicle large, loose, spreading, and leaning slightly to one side; spikelets of two florets on long foot-stalks; lowest floret barren or male only, with a very long awn arising from a little below the middle of the pale; upper floret perfect, with a short awn from immediately behind the summit; both florets hairy at the base; glumes two, and very unequal; root fibrous, slightly inclining to bulbous, and perennial.

This grass is cultivated in France to a greater extent than any other kind whatever, from which cause it is sometimes popularly known under the name of "French ryegrass." The culms have an average height of from 3 to 4 feet, with *long* flat leaves of a vivid-green colour. Although rather late in flowering—blooming towards the end of June and onwards—it produces an early and very plentiful supply of herbage in the spring months through its abundant root-leaves, and reproduces itself also very rapidly after being eaten or cut down, being one of the fastest growers of all our grasses. It has not been as yet much cultivated in this country, and consequently its agricultural merits are but little known; on the Continent, however, it is in some parts much cultivated, and is said to be eaten freely, or even greedily, by all kinds of cattle. Seeing that such is the case, it is very probable that, if farmers would make certain to sow only the seeds of the *true fibrous-rooted* species, the tall oat-grass would be found eminently qualified to sow either for hay crops or pasturage in any course of rotation usual in alternate husbandry.

The seeds presently rate at about 7d. to 8d. per lb. It is evident, however, that they might be had cheaper; and if a demand to any extent was springing up, they would doubtless soon become so.

The other species, *Arrhenatherum bulbosum*—bulbous-rooted oat-like soft-grass—is much more common than the preceding in most parts of this country, being found frequently growing on soils of a lightish nature by the hedge-sides of pasture and corn fields. Its root is formed of a series of small tubers or bulbs



(sometimes as large as small marbles), but slightly attached to one another; and, from the great tenacity of life which these tubers possess, this species is considered, and justly so, a most troublesome weed in cultivated arable land, and is with great difficulty got rid of: it is known to farmers in some places under the name of *knot-grass*. The herbage of this species is of coarser quality, and is not relished by cattle, not being eaten by them so long as any better herbage is to be had.

## HARDISH FESCUE GRASS.

(*Festuca duriuscula*, of the tribe *Festucaceæ*.)

Panicle erect, the upper part racemed, the lower branched, and spreading mostly to one side; stem under the panicle round and smooth; florets or seeds terminating in a point or short awn; leaves of the stem broader and more flattened than the root-leaves, which are long, narrow, and compressed, or wire-shaped, and evergreen; root perennial, fibrous, but very slightly creeping, and occasionally throwing out lateral shoots.

This is one of the best of our native grasses for *general usefulness*. Upon good land it grows to a height of from 18 inches to 2 feet. Like the dogstail grass, it has a very considerable range of adaptation, growing and thriving well upon widely different kinds of soils, and is well suited particularly for soils of a light, dryish nature, as it resists better than most grasses the withering effects of excessive drought and heat in summer, and also maintains much of its vitality and greenness during winter. On account of these properties, and of its fine herbage, it is specially fitted as a main ingredient for laying down gentlemen's parks, lawns, and ornamental sheep and deer walks, these animals, besides, showing a high relish for this grass. It ought, however, never to be a *prominent* member in any mixture of seeds for pasture upon good arable land which is to be grazed principally by the *larger* cattle, as it is much inferior in productiveness and nutritiousness to most of the other pasture-grasses previously handled. This species matures its seeds about the middle of July, or sometimes rather later, and yields double the amount of nutriment when cut at the time of flowering than it does when the seeds are ripe. Good seeds average about 12 lb. weight per bushel, and sell presently at about 6d. per lb.

A number of grass plants peculiar to the *Festuca* family are placed in the works of the older botanists as distinct species, such as *F. rubra*, *F. arenaria*, *F. glabra*, and *F. cambrica*, &c., but these are now all looked upon as *varieties* more or less wide of the hardish fescue. These varieties are distinguished chiefly by their creeping habit of root, and are found the most frequently upon light sands near the sea-coast: they are not suitable for cultivation except upon very light, dry lands, where the fibrous-rooted grasses do not thrive. The best of them is the *F. dur. rubra*, purple or creeping hard fescue, which is a tall, robust-growing variety, with the stem-foliage and also root-leaves broader and flatter than in the normal plant, and of a reddish-purple tint: its roots are powerfully creeping, throwing out lateral shoots; and it is very useful for sowing upon and consolidating drifting sands which have been brought under cultivation. The seeds of this variety usually rate a trifle higher than those of the common species.

## SHEEP'S FESCUE GRASS.

(*Festuca ovina*, of the tribe *Festucaceæ*.)

Panicle short, contracted, and one-sided; spikelets of five or six florets, with very short awns; stem erect, quadrangular immediately under the panicle, and more or less roughish; root-leaves numerous and very narrow, rough and rigid, much curved, and of a rounded shape, and grow in small tufts; root perennial and fibrous.

This dwarfish grass grows naturally on rather dry soils, having a height in the culms of from 4 to 12 inches. It forms the greater part of the herbage upon many of the best sheep-pasture grounds in the Highlands, being in a special degree the favourite food of sheep; indeed, it is said that sheep have no relish



for hill-pastures and heaths upon which this grass does not exist. The smallness of its produce renders it entirely unfit for hay crops; the *F. ovina* being much inferior in bulk, and also in nutritiousness, to the other agriculture fescues. Probably, however, from its very *fine* herbage adapting itself to the thorough reducing process of sheep's mastication, the *F. ovina* may yield up to them a greater amount of aliment than some of the more nutritious but larger and coarser grasses. The sheep's fescue has a very high altitude of growth, being found frequently at an elevation of 3000 to 4000 feet above the level of the sea, and is peculiarly adapted for sheep pasturage on all upland, heathy, or other soils, except when such is of a *wet* character. It might seem from the fineness of its herbage to be suitable for sowing down lawns, bowling-greens, &c., but it is disqualified for such purpose through its tufted habit of growth, and the difficulty experienced in shaving it close, so as to form a smooth, regular surface. This species flowers about the middle of June and onwards, and ripens its seeds from the middle till end of July. The seeds rate at from 6d. to 8d. per lb.

There are many *varieties* of the sheep's fescue, and a few of these are treated by some botanists as *distinct* species. The following two are the principal ones, as being entitled to much notice from their agricultural or other merits.

*F. ovina*, var. *hordeiformis*—barley-like fescue. The chief property of this variety is its earliness of growth, excelling in this respect the hardish fescues, and affording a very early bite to sheep. It comes into blossom about the end of May or early in June. The herbage is very fine, tender, and succulent; and the awns of the florets are long and barley-like—hence the name. The culms of this variety are longer and more uniform in thickness, and are suited for the manufacture of some of the finer kinds of straw-plait.

*F. ovina*, var. *angustifolia*, the *F. tenuifolia* of some botanists—fine-leaved fescue. This is a delicate variety, with much longer and more narrow, slender leaves, and is also of a *less* tufted habit. It is not a frequent grass throughout Britain, but is common in some parts of our Highlands; and it abounds along with the normal sheep's fescue in many of the dry pastures of France. Although of comparatively little or no importance in the alternate cropping culture of land, it is well suited for forming a fine, close, short sward of grass in pleasure-grounds and suchlike.

The *F. ovina*, and its *varieties*, bear a resemblance more or less to the hardish fescues, but differ from them in being of smaller size and of a somewhat tufted habit, in the upper part of the stem being *rough* and *angular*, and in the root being always purely fibrous.

The reader will recollect what was previously mentioned of several large-growing species with *broad root-leaves*, formerly included in the genus *Festuca*, having been now placed under and constituted a new family, viz., *Bucetum*; so that now, besides the *F. duriuscula* and *F. ovina*, there are only other two *distinct* species native to Britain, viz., *F. bromoides* and *F. uniglumis*. The *Festuca bromoides*, barren fescue grass (placed by Lindley as *Vulpia bromoides*, and is the same plant also as the *F. myurus* and *F. pseudo myurus* of Hooker, &c., which are only varieties of it), is a very common *annual fibrous-rooted* plant in Scotland and elsewhere, and the Ayrshire seedsmen and seed-raisers are much troubled in getting its seeds cleaned out from amongst the rye-grass. Its seeds are known in popular phraseology as "hairgrass," evidently derived from the *hairlike* appearance of the seeds with their *very long slender awns*, but the grass itself has no connection with the *Aira* family. When growing on thin, dry soils and situations, the barren fescue is found from 2 to 6 inches in height, of a rigid make, and soon becomes parched; but on good cultivated land it grows to the height of 2 feet or more, of a graceful slender figure, with the panicle more luxuriant and gently drooping to one side. It is very worthless as a hay grass, and completely so, from its strict annual nature, for pasturage purposes; still, owing to its *annual* growth, and also in that it has short *fibrous* roots which do not exhaust the soil, it does not by much deserve the excessive bad name which it gets as a weed; it is not nearly such an injurious



plant the seeds of which to sow as are the crowfoots or "crawtae," the creeping wheat-grass or "couch," or even the Yorkshire fog, or some species of the *Bromi* ("goose grasses").

The remaining species, *F. uniglumis* very much resembles the barren fescue, and is equally worthless as an agricultural grass. It is distinguished, as its name imports, by the almost total suppression of the *lower glume*. Though found in the south of England and Ireland, it is rarely, if ever, to be seen in Scotland.

These last two species are the only ones which can be classed as weeds in the large family of the fescues—both broad-leaved and fine-leaved—the *Festuca* genus ranking as the most valuable of all the grasses for hay and pasture purposes.

#### SLENDER OR RYEGRASS-LIKE FESCUE GRASS.

(*Festuca loliacea*, of the tribe *Festucaceæ*.)

Inflorescence spiked; spikelets of an acute oval form, on short footstalks, and of six to nine awnless florets; calyx always of two unequal, smooth, acute glumes; outer pale of floret five-ribbed; ligule very short and slightly decurrent.

This broad-root-leaved fescue is a native naturally of *moist* rich meadows. Its culms grow to about 2 feet in height, and its root is *strictly* perennial, fibrous, but sometimes slightly creeping. This species differs from the meadow fescue in having its inflorescence *spiked* as in the ryegrass, and in a greater love for marshy or wet soils, but otherwise much resembles it in the habit of growth and bulk of produce. Although the ryegrass-like fescue is more particularly adapted for sowing on good meadow-land, to be kept under irrigation as a hay grass, it also makes a good *permanent* pasture-grass for fertile, *rather moist* soils, superior to the ryegrass; but its cultivation is somewhat hindered through the difficulty of procuring sufficient supplies of seeds—the *true F. loliacea* producing but a small quantity of matured seeds, from which circumstance, and its general appearance and habits, it is considered a hybrid betwixt the meadow fescue and the floating sweet meadow-grass. There are several intermediate varieties, however, between it and the meadow fescue, with the spikelets on short branches at the base of the spike, which varieties are about equal in value, and more prolific in seed, and these are the sorts usually sold by seedsmen. Some of the varieties of this species are common on the best grazing pastures in parts of Belgium and of the Low Countries. The *F. loliacea* flowers during the month of July, and contains most nutritive matter at the time of flowering. It bears occasionally a considerable resemblance to the common ryegrass, but differs from it in its greater abundance of root-leaves, in the spikelets having *short foot-stalks*, and its calyx *always* consisting of *two glumes*; it possesses, besides, a more perennial habit, improving in proportion to its age, which is exactly the reverse of the ryegrass. The *F. loliacea* is not generally quoted in seed lists; the price of its seeds may be given as from 1s. to 1s. 3d. per pound.

#### TALL FERTILE FESCUE GRASS.

(*Festuca elatior*, of the tribe *Festucaceæ*.)

Panicle very large and compound; florets sometimes, but rarely, furnished with a very short rough awn from immediately behind the summit; summit of floret or seed membraneous, and the florets have a streak of red round the edges; stems smooth and striated, and very leafy, growing in height from 3 to 4 feet or more; root perennial, fibrous.

This plant may be considered the original of the *broad-leaved* fescues. It is found growing frequently upon rich, muddy clay ground along river sides, sending its roots deep into the soil, and which have a *slightly-creeping* habit. The panicle is a foot or more in length, widely spreading, and drooping to one side; in all other respects it is the same as the meadow fescue, but nearly double the size in all its parts. The writer has had several opportunities of seeing this grass



(*F. elatior*) grown for hay, and upon the whole considers it to rank about first of the superior grasses in yielding a large bulk, equalling, if not excelling even the cooksfoot, especially so when grown upon rather wet, deep, clayish soils, or even on lighter medium soil *incumbent upon clay*. When grown for hay it ought to be mown early, just when coming into flower, as it not only contains more nutriment at that period of its growth, but also because it becomes rather coarse and reedy when allowed to stand till ripe. The tall fescue has been kept in the back ground and neglected on account of its somewhat coarse appearance, but it is freely eaten and relished by cattle either green or dry, and if mown as directed, would very amply repay in the hay crop, and also as pasture, upon all fertile medium clayish soils. To cultivate this grass under a similar system with the Italian ryegrass, it ought, and probably would, return an immense bulk: being rather a late grower, it would come in for cutting just about the time when the productive powers of the Italian were exhausted. The *F. elatior* flowers from the beginning till the middle of July, and ripens a profusion of seed in the early part of August. The seeds rate presently at about 9d. per lb. by retail; but if done on a larger scale, they could be preserved so as to sell at a much less figure, and yield at same time a handsome profit to the raiser.

The following three species fall now to be shortly noticed, and which will finish the important family of the fescue grasses.

*Festuca gigantea*, formerly placed by Linnæus, Hooker, and others, as *Bromus giganteus*—tall-bearded or giant fescue grass. This prolific species is now classed in the same family as the *broad-leaved* fescues. It is easily known from the tall fescue by its long beard or awn, which is much *longer* than the palea, and arises from *behind the summit*, and also by its *leaves* being *much broader* and of a very *dark green*. One distinctly-marked distinguishing character of it from that of the *Bromus* genus, is its *ligule* being *very short, decurrent*, of a reddish-brown colour, and embracing the stem more on one side than the other. It has, however, the peculiar mark of the brome grasses in a much greater degree than the other broad-leaved fescues, viz., in the summit of the outer pale being cleft into two points, whereas the *summits* are only *slightly membranous* or ragged in the others. It is probably a cross betwixt the tall fescue and some one of the wood-growing species of the *Bromi*. The root of the giant fescue is fibrous and perennial, and its culms grow to a height of 3 to 4 feet, or sometimes more. Its natural *habitats* are in woods or other damp shady places, but it is found to grow well enough and thrive when cultivated in open fields; and though seemingly not much relished by cattle in a growing state, it is readily eaten by them when cut and made into hay. It would yield a very large bulk, and possibly might become more palatable if for some time under culture, and it is well worthy the attention of cultivators.

*Festuca calamaria*—wood-reed fescue, but which is now placed in the genus *Poa* as *P. sylvatica*—wood-reed meadow-grass. This species is of rather rare occurrence in this country. Unlike the preceding, it seems to be much relished by both cows and horses, as it is greedily eaten by them when found. It very probably possesses good properties enough entitling it to a share of cultivation, but its culture is much hindered through the difficulty of procuring its seeds in any quantity; however, its seeds are now offered in *foreign* lists, and, if they may be depended upon as genuine, can presently be had at about 9d. per pound.

The species *F. heterophylla*—various-leaved fescue grass—is a native of France, although now nearly fifty years since first introduced into Britain. This species is *extensively cultivated for hay* in some parts of the Continent, yielding a large bulk to the first cut, but its aftermath is said to be very inconsiderable. The root-leaves are long, narrow, and dark green, whilst its stem-leaves are broad and of a much lighter green: the root is fibrous and perennial; and its flowering culms, which are very numerous, grow to a height of from 3 to 5 feet. Price of its seeds, from 9d. per pound.

(To be continued)

# EDINBURGH VETERINARY REVIEW

AND

## Annals of Comparative Pathology.

---

### ORIGINAL COMMUNICATIONS AND CASES.

---

*Veterinary Records.* By G. ARMATAGE, V.S. to the Marchioness of Londonderry.

#### DISEASED CATTLE, AND THE ENDS TO WHICH THEY ARE APPROPRIATED.

A FEW instances of disease in cattle, &c., out of many which have come under my notice, are selected, as showing the principle upon which the traffic in unwholesome food derives an origin.

The farmer, whose income depends upon circumstances so variable in their results, is naturally trained in a disposition to be watchful and tenacious. To him, the fluctuations of markets have their vast importance; the wind and weather to a great extent decide for him his crops; and disease may smite with direful effects his flocks and herds. While the goods of the merchant are said to eat no bread, the live-stock of the farmer requires constant attendance and regular food, involving an expenditure of time and money—states which, from the effects of disease, are obviously aggravated; and not only rendered perhaps unprofitable, but probably a serious loss.

Under such circumstances, therefore, and with a knowledge of their tendencies, it is not incompatible with his calling, nor does it become a matter for surprise, that he should use his best endeavours to mitigate these effects at all available opportunities; and in these, as every other difficulty, there are those whose good offices are never wanting, whenever there is a likelihood of gain, no matter of what character the proceeding may be. By some kind of telegraphy or freemasonry, the carrion dealers sniff out the dying or dead; in fact, "*wheresoever the carcase is, there will the eagles be gathered together.*" These men open out those means, which are readily embraced, and stamp the verity of the proverb, "*the first loss is always the least;*" and thus with the meat "fresh from the country," together with that which the town dairies afford, drive on a roaring trade—smuggling, as it were, beneath the very nose of the exciseman.



## 1. URÆMIA OCCURRING FROM OCCLUSION OF THE URETHRA IN AN OX.

A short-horn ox, which had been used for some time as a working beast, aged about three years, was found to be unwell, and my attendance was requested. The pulse was accelerated but not voluminous, indicating a degree of irritability of unusual character. A general equalisation of temperature prevails, but the coat looks rough, and the animal has been observed to lose flesh rapidly. The most anxious expression appears in the countenance, and the head is often turned round to the sides, but not so far as to allow the nose to reach the flank. Symptoms of uneasiness are also present—he does not rest or lie long, but rises often, though stiffly, and is repeatedly shifting the hind legs.

No urine has been seen to be passed for some time—extending over three or four days—and in order to detect the accuracy of a suspicion, he was removed from his fellows in the feeding-house to a separate stall and building.

It was on the day succeeding the change that I saw him, and the stall floor was then perfectly dry; and in addition to the symptoms already detailed, the prepuce and sac or sheath covering the penis was observed to be considerably swollen, hot, and painful, the animal becoming furiously excited on its being touched. No other cause could be assigned for the occurrence than a possibility of one of the other animals having trodden upon the organ when the patient was lying.

The appetite was absent, and no desire for water present. The mouth was extremely foetid, likewise the evacuations, which were scanty and hardened; respiration not much interfered with. The bladder was found full, hot, and extremely painful, and any attempt to force out the contents through the natural passage resulted only in a complete aggravation of the general disturbance.

The animal being in very fair condition, the owner determined to avoid a total loss by having him slaughtered, notwithstanding hopes being held out of some good resulting from an operation to relieve the bladder, and at the same time objections which were urged against the quality of the flesh for human consumption. Failing, then, to apply successfully any remonstrances against the intended proceedings, I left, with the intention of calling on the following day to inspect the diseased parts.

Early in the morning I was informed the poor beast had been walked a distance of three miles to a butcher three doors from my residence, who had also slaughtered him for the London market, and that I might make an examination of the diseased parts, which I accordingly did shortly afterwards.

The skin being removed from the sheath, disclosed a great amount of serous infiltration and diffused swelling of the abdomen, from which the penis and all structures involved were as carefully removed as a butcher's astuteness would admit. The

whole was highly offensive, of a dirty green colour, and emitted a strong and foetid ammoniacal odour. The surrounding areolar tissue allowed a thin serous fluid to ooze from it. The penis was immensely swollen, general structures obliterated, of a dark colour, and partaking of the general offensive characters of the surrounding tissues. Urethra closed, and walls united by the interposition of effused lymph, the whole partaking of the same appearances. No calcareous matter was found in the canal, which led to the belief that the cause assigned was most probably correct.

The butcher stated the animal did not bleed well, which accounted for the darker colour of the meat; besides, it possessed an odour not unlike the parts extensively affected with disease, but by no means so strongly. Sensible, however, of his own reputation in the town, he had the *larger* portions of the carcase deposited within large hampers, covered with sheets, and sent to the metropolis through an invisible agent, instead of offering it himself for sale. It fetched about three shillings per stone. I was also assured that, having missed the train with the carcase, and being compelled to keep it through the second night, the odour was by no means lessened, but the contrary.

An assistant, who dressed the carcase, afterwards suffered from an ugly wound in the hand, as was supposed, by the absorption of matter from the region of the penis; but how far this was correct I do not know.

## 2. SCROFULOUS DISEASE IN A BULL.

A farmer of my acquaintance held in very great estimation a fine bull of the celebrated "Langston" breed. When about a year and a half old symptoms of disease made their appearance upon the lower jaw and superior maxillary bones; *osteosarcoma* and *spina ventosa* of some writers, *fibro-plastic degeneration of bone* of Professor Gamgee,\* and in the district vernacular, "*cancer*."

The owner wished me to undertake the removal of these, now enormous, tumours, and upon my asserting the incurable nature of the disease, said an old man in the village would be glad of the job; to which I replied that I would not undertake such a task on account of the deception which would be practised; but if he liked to let the old man try his skill, *and if he succeeded in safely removing the cancers* (?) I would endeavour to profit by the lesson set forth.

Full of hope, and certain of gaining a laugh at me for my supposed obstinacy and foolishness, the old cow-leech was sent for at once, but would not *operate* in my presence. Therefore I yielded

---

\* See fig. 38, page 74, vol. i.—"Our Domestic Animals in Health and Disease," by Professor John Gamgee.



with all submissiveness and courtesy to his modest request. In a few days other cases upon the same farm required my attendance, and I looked in upon the *cancered* bull, when I was requested to note the line of separation which had unmistakably appeared, and the evident success of the undertaking which I had so *imprudently* refused. The poor brute appeared as if his jaws were glued together; an immense circular swelling, four inches or more in diameter on either side, reaching from the anterior molar teeth to the eyes, and not unlike the colour and nature of the hide of the rhinoceros, beautified his general appearance, and was pronounced to be the acme of perfection; health and soundness following close upon their removal, which was now almost hourly expected. The poor brute was losing flesh rapidly, fever ran very high, appetite absent, and general systemic disturbance extensive; symptoms not entertained in the practice of the old cow-leech, who congratulated me on an opportunity of *seeing something*.

Returning next morning, I was requested to see the cancers which had now sloughed off, and along with about a dozen others of a similar nature, the old man had strung them on a rope which he carried about in his cart to exhibit in proof of his powers. The animal was laid *down to rest*, I was told, but I found him *paralysed*, and totally unable to rise. The cheeks were absent, with a portion of the jaw-bones and a few teeth on each side, so that the food passed out as fast as it was taken in. This animal was immediately killed, much to the chagrin of the "*doctor*," who still persisted in a cure being probable; and in defiance of all persuasive means, the carcass, *minus* the head, was dressed, and sent to London.

The worthy enemy to cancers, when called upon to *operate*, used an ointment of arsenic and corrosive sublimate (which he applied indiscriminately to all swellings, such being cancers in his estimation; horses, sheep, pigs, &c., alike receiving his due attention). The absorption of the metallic poison, which had been applied several times, evidently caused the paralysis referred to. The operations of the same individual brought many cases of a similar character under my notice, all of which, after being found incurable, and he making a clean shuffle of them, were dressed and sent to the metropolis.

Of the number of animals sent to London and other large towns for human consumption, by far too large a proportion are of a diseased character, and not fit for human food, the agricultural districts providing a fair share. The farmer within easy railway access to London or other large places speedily despatches the dressed carcasses of diseased animals, and finds no difficulty in consigning them to some butcher, who can get rid of them to the poor at a low price. If disease enters the stock, in many instances no treatment is adopted, and, to use a common expression, the animals

are killed to save their lives. Should, however, treatment be pursued for some time, it not uncommonly happens that the veterinary surgeon finds himself supplanted by the native butcher or carrion agent, who prescribes "*cold steel*;" and after being thoroughly impregnated with various medicines, the carcase eventually finds its way to the stall of the butcher in town, and all the arguments which the former may raise will not prevent the course being adopted. In fact, so far are the arrangements perfected for securing the transmission of such carcasses, that these carrion agents who slaughter them are provided with *printed address labels*, which are tied upon large hampers furnished by the carriers in the neighbourhood. The rapacity of these individuals is such that nothing can escape them. Cows which have suffered from protracted and difficult parturition, with rupture or inversion of the womb afterwards, either under the effects of vitulary fever, chronic impaction of the digestive organs, or those animals which are perceived to exhibit the earlier symptoms of "black quarter," likewise form their staple commodity. One man whom I knew, boasted of the number of "*slinkers*" or "*chockered*"\* beasts which he had collected, slaughtered, and sent to London, most of which were not only greatly diseased, but probably also saturated with medicines of one kind or other. In the agricultural districts of the south, I have known sheep and pigs, which have *died* in parturition, or from inflammation of the bowels, actually *sold* by a farmer to his labourers.

Giddy mutton is always consumed, and considered much sweeter than other kinds.

In a flock of sheep which had been depastured near a river, on some very low-lying land subject to inundations, I found on my arrival seven extremely ill, in fact, dying from inflammation of the lungs. Three were already dead, having been slaughtered in their last moments. The whole were sent to London market. Upon examination, the liver contained flukes (*distoma hepaticum*), and in the bronchia were also present a great number of the *Strongyli filaria*.

Cases of lung disease in cattle are not so commonly met with in practice, and for treatment, as formerly. Owners find it more profitable to employ the carrion agent at once, who speedily removes the animals so affected.

If the cow clubs of the midland counties were to allow an inspection of their books, I doubt not but some rare facts would come to light, as showing how the most is made of things with them.

---

\* Slinkers or chockered animals are those which are affected with dysentery and liver diseases, dropsy, &c., as a result of their being fed and housed imperfectly, and the effects of cold marshy land on which they are kept.



*Are We Progressing?* By A VETERINARIAN.

IN these days of utilitarianism—of progress and advancement—it almost amounts to a disgrace not to be engaged in the competitive race. Machinery is constantly taking the place of hands, and even horses ; but, as it carries on its work of revolution, there is a kind of contemporaneous remodelling and reconstruction keeping pace with that movement, as certain branches of trade and manufacture are proved to be too slow in their capabilities of productiveness to meet the general demand, and also unequal in their remunerative characters for the amount of time and capital expended. A more summary mode, combining efficiency with economy, is at length devised and carried out ; the attendant operators themselves, who before were proof to all innovations, at length acknowledge the hand of improvement, and quietly assume the attitude required under the change in the order of things ; in fact, all in their turn are more or less influenced by the endless process of events, and lend their aid in raising the vast mountain of human achievements, and stupendous monument of collective industry. Little by little, yet gradually and resolutely, the work advances, and each one of the general community comes in for a share of the resulting advantages and conveniences. There is scarcely a trade which has not experienced effects of the revolutionising tendencies of the present age ; and still more scarce is any branch of industry in particular which has not correspondingly reaped a fair share of benefit. Where success has not been achieved, it mostly happens as a result of nonconformity to the true principles of advancement.

Progressional development is a task in which all well-constituted minds must engage, as it is the only element which will perpetuate their existence. The road lies through a course of constant perplexity and drudgery, acquaintance with which can only be obtained on perfect grounds in accordance with the length of time spent upon it, and the minuteness with which its windings and intricacies are studied ; and in proportion as a pursuit after investigation and improvement is extended, do opportunities present themselves more numerous, the perceptive faculties are rendered more keen, by which those opportunities are the more readily recognised, and there also result a desire and a necessity for embracing them. In proportion, also, as each generation thus becomes wiser, the greater are the demands for knowledge, and the more extended the means by which its ends are made available.

Purposes, to be available, must ripen into effect and vigour of action, or they will subside into nonentity and rottenness—success or discomfiture !—there is no half distance—we cannot have

both. We must do something ; we may not be rapid or brilliant and effective at once, but let us be doing. Success will not possibly attend a primary effort—but let us try ! There is matter for rejoicing even in a first attempt, feeble though it may be. We need not be discouraged—facility comes with patience.

Such are the principles which pervade and emanate from the greatest minds of the present age, and the evidence naturally suggests to us the question, “ Are we making that progress and assuming the position which, as a professional community with the present state of things before us—the march of intellect in all its phases—we are called upon to do ? ” It has been urged that a veterinary surgeon is not called upon to take any part in the competitive race of mankind, his professional calling does not admit of it ; or that once being duly installed with the necessary qualifications, the career of doubt, difficulties, and perplexities is, or should be, at an end, and what remains is for each to seek out means most accessible, and offering the greatest facilities for the attainment of affluence, the greatest professional successes being measured only by well-filled coffers, and the respectability of the man judged by the amount of independence he exhibits to those around him.

It would be vain to assert that an opulent veterinary surgeon is a superfluity, nor should we reprobate the principle of his seeking substantial and deserved remuneration. He, among all others, as a class, has great and legitimate demands in common with his brethren of other avocations. I would not willingly incur the just displeasure of your readers by such temerity.

But I may inquire, “ Are not our thoughts more frequently of a mercenary character, and too little exercised in the common welfare of the brotherhoods, or towards keeping pace with the tide of general information, which, with ever ceaseless roll, calls for constant application and watchfulness ? ”

My belief is that such is too true an aspect of the general body at the present moment, a state which constitutes the important elements of our “ *Opprobrium Medicina Veterinarius*.” The generic signs of the “ cow-leech ” and “ horse farrier ” still cling to us, and upon every occasion we do not omit to expose the indications of our ancestral rise.

I can find some excuse for the asseverations of a book-sick student, whose acquaintance with literature dates from his entrance to college, and who sighs to put an end to it with his departure—to carve out for himself a season of supposed relaxation in a course of practice, and accordingly disposes of his vademecums and text-books to some more erudite follower, or places them in obscure corners, henceforth to be enveloped in dust and cobwebs ; and can to some extent understand the necessity for a change in the routine of a pursuit of knowledge, in which the mind shall not only find relief, but that renewed vigour and



more determined effort shall mark the next attempt to solve the vexing problem in science ; but what I have to plead is an entire difficulty to reduce to a state of harmony with our "position" and objects, as viewed by the public eye, the fact, that so few in the profession trouble themselves with what goes on either in the professional world or even in their immediate vicinity. Not only could we utter our lament with Mr E. C. Dray, who stated at the dinner of the North of England Veterinary Medical Association, on July 21, 1864, that "he knew a veterinary surgeon in one of the largest towns in the county of York, who is neither a member of a veterinary medical association, nor does he take in a veterinary periodical ;" but we could also indorse the statement by a multitude of similar facts.

We should not pin our faith to a goodly array of well-occupied book-shelves, under a fancied belief that possession merely in that case implies profound scholarship. A bibliotaphe, above all men, is to be dreaded. But when the diploma is taken for the passport to perfection, to the utter exclusion of all books and periodicals published in future, and association with members of the same profession not to be entertained, as detrimental to personal interests, the fact is a sufficiently startling one in the nineteenth century. When a man selects for himself an honourable calling, a profession, a science, the pursuit of the study of Nature and all her glorious attributes, does he do it by contract, and feel himself capable and called upon to accomplish the task by the expiration of a time pre-arranged ? Are the laws of Nature then so easily comprehended, that a veterinary surgeon obtains all the information he needs during his matriculation ? And are their effects always the same, so that he will need no further assistance except what his practice will afford ? If the right stuff be in him, we venture to predict his most unqualified reprobation of those promptings of self-satisfaction, ignorance, and prejudice.

I also happen to know veterinary surgeons who do not possess half-a-dozen books of any kind whatever ; and veterinary periodicals are unknown, or at least quite rare, and a novelty ; their purchase being accomplished in conjunction with some (harmless) neighbour, preservation for future reference not being cared about ; and can it be possible ? their pages sacrificed for enveloping a bolus or packet of medicine to be sent out.

Goethe once observed, respecting Englishmen, "That their superiority consisted in having the courage to be what Nature made them." And we would add, how much more ennobling to our character would that courage be, which could lead us to value more and hold priceless the acquisition of sound knowledge ! The compliment paid by Goethe tells a piercing tale ; for he adds, "They are complete men, sometimes complete fools also ; but that is something, and has its weight." There is too much of

an overbearing obstinacy towards views different to those already accepted; a kind of wrapping up in a mantle of mist and fog of self-manufacture; an illiberalism, which tells of being conglomerate without elaboration.

What, then, do we seek? Higher rates of remuneration? Let us render ourselves worthy of them! But grooms and quacks are preferred before the veterinary practitioner! Yes; they are the residue of the class which at one time produced the only men who knew anything of the lower animals; hence the name, *Veterinarius*. Let us seek to supplant him by sufficient education, and engender an appreciation of, and love for, investigation and scientific research in the rising generation, by furnishing the ground-work before entering college; let us induce the powers that be, to adopt a more rigid and extended curriculum, and wider range of examination. Place all the resulting advantages before the veterinary practitioner; and depend upon it, no difficulty will be too great, no obstacle too high, and no occupation a greater pleasure. The profession is not rightly valued, because the materials are not furnished at the outset. We might as well expect to be able to form a splendid mansion out of the elements of a mud-walled cottage—the cannibal of New Zealand to become a statesman—as in every case to expect tailors, shoemakers, blacksmiths, and scores of other individuals, without a thorough preliminary education, will become scientific and efficient “veterinarians” in the short space of time at present allotted for study.

How few of this class of men are called to fill posts of a public character! Yet, many men in the medical profession are appointed to offices of trust, as sanitary inspectors, &c. Why should not veterinary surgeons act as sanitary inspectors for the lower animals?—They are the proper persons. We are too far behind! Let the profession bestir itself!

---

*Granular Conjunctivitis.* By A. J. MURRAY.

ABOUT the end of February, during the present year, I was requested to examine the near eye of a grey hunter belonging to J. Montgomery, Esq., of Cirencester. On looking at the eye, I immediately observed a pink-coloured sort of tumour about the size of a cherry at the inner canthus, which protruded about half an inch across the eye, and also pressed outward, or elevated both the upper and lower eyelids. The tumour evidently occasioned considerable pain and inconvenience; in the first place, by pressing on the cornea; and, in the second place, by interfering with and impeding the movements of the eyelids. Though the eye appeared weak in consequence of the irritation produced by the tumour, it was otherwise sound. Having everted the eye-



lids slightly, I then observed that this tumour was situated on the cartilago nictitans. I advised that this morbid growth should be removed, as it already occasioned inconvenience, and might prove still more inconvenient if allowed to remain. The owner, however, was hunting the horse at the time, and consequently did not wish to have the tumour removed immediately. As the pain and inconvenience which the horse suffered increased, and there was a discharge of blood on several occasions from the eye, he was sent to me on the 13th of March, when, having cast the horse, and directed my assistant to evert the eyelids, I removed the tumour. It was very vascular, and, considering its size, there was a considerable amount of hæmorrhage. The tumour was soft and broke into fragments, but I cut away its base as close to the hair as possible, and the blood suffused on the eye was afterwards removed with a sponge and warm water. Directions were given to bathe the eye occasionally with warm water for a day or two, and then to apply occasionally a lotion of sulph. zinc, gr. ii; aqua distillat.,  $\bar{3}$  i, until the wounded surface had healed. The horse was hunted two days afterwards without bad results, though the weather was cold and damp. On looking at the horse's eye again, however, on the 30th of March, the tumour appeared to be growing again, I therefore applied solid argenti nitras to this new granulation, and by repeating the application several times, prevented any further development. This form of conjunctivitis is described by Druit in his "Vade Mecum," though I am not aware that any English veterinary author has described it. Druit describes this disease in the human frame as a thickening of the conjunctiva, owing to chronic inflammation, but in those cases occurring in the horse which have come under my observation, the granulations form upon, but are quite distinct from, the conjunctiva. They may grow on any part of the conjunctiva, and in slight cases may be cut off with scissors.

On examining a section of the tumour under the microscope, it presented a fibrous structure, and cells filled with granular matter occupied the spaces situated between the bundles of fibres. Professor Law, of the New Veterinary College, also examined this tumour microscopically, and came to a similar conclusion as to its structure.

---

*Typhoid Fever in a Pig.* By the SAME.

A BRIEF account of this case is sent, not on account of the importance of the case, but rather because so little attention is paid to the diseases of this animal, that pig pathology may almost be regarded as a *terra incognita*. I cannot congratulate myself on having seen a great mortality among pigs from this disease,

though I have occasionally seen several pigs die suddenly without any careful examination being made, which might probably have revealed *post-mortem* lesions such as I will now describe.

I saw this patient on the 11th of August, and it had been ill for several days previously. It had not partaken of food for several days, and had been receiving castor oil and sulphur mixed with water. The pig should have farrowed in about a week from the time I saw it. The pig was lying down when I saw it, and, with the exception of the end of its snout being dry, nothing unusual was observed in the animal's appearance. The bowels were constipated, however, no dung having been passed since the commencement of its illness, and all secretions were diminished. On making it rise up, it appeared to suffer pain when standing, as it continued screaming while on its feet, but became quiet when it lay down. Though it did not eat, it drank water copiously, so I dissolved four ounces of mag. sulph. in its water, which had the effect of inducing an action of the bowels on the ensuing day. I was afterwards informed that the pig became worse, so that she was killed two or three days after I had seen her, as she was in rather good condition. I, however, had an opportunity of examining the internal organs. I observed nothing abnormal until I came to examine the intestines. The mucous coat of the small intestines was in some places of a dark-red colour; and on examining the colour, I found it covered with yellow patches, resembling in colour the scars which are left by the firing-iron upon the skin. On examining these patches, I found that the mucous membrane becomes yellow before it is cast off, it then breaks up into shreds, detaches itself, and exposes an ulcerated surface. The surface of the ilio-cæcal valve was completely ulcerated, and these yellow patches extended nearly to the termination of the colon. The uneasiness of the pig while standing must have been caused by the pressure on the ulcerated intestines, as immediate relief was experienced when the animal lay down. The flesh did not appear unhealthy, though the fat and cellular tissue had a slightly yellowish tinge.

---

*Observations on the English Blood-Horse.* By JOSEPH GAMGEE,  
Senior, New Veterinary College, Edinburgh.

WHEN, two years ago, the Royal Agricultural Society of England invited contributors to send in essays on "The Breeding of Hunters and Roadsters," by the wording of that announcement, intimation was given of the classes of horses whose general standard of excellence and number required to be raised, in order to meet the universal demand for good horses.

The timely announcement met with response, in so far as



many experienced men sent in papers on the subject of horse-breeding ; and after the publication of those selected, discussion on the matter followed ; all so far gratifying to the promoters of the inquiry, and encouraging to those who hoped to see useful knowledge brought to bear on the whole subject, and much that would be found erroneous laid aside ; in fact, to all who wished that rules might be laid down, and some better common system of horse-breeding established.

After many months' discussions, in which gentlemen of experience in horses and their breeding have taken prominent part, it appears to me that no advance has been made ; and recently, evidence has tended to show that there is no agreement on any single proposition raised ; so that if the discussion were to stop at the point arrived at, the whole question would be left in more confusion than prevailed before any stir was made on the matter.

The causes of the unprofitable result of the discussion hitherto, may be found, I think, in the non-following out the programme of the Royal Agricultural Society, of considering the question of "breeding hunters and roadsters," which, to intelligent horsemen, means, the bulk of English and Irish horses, and by going into which, the general question of horse-breeding would be involved in its relations. But all discussion has, from first to last, centered on the English blood-horse, and his prototype of Eastern origin ; and, in deference to the current of opinion, I also am disposed to say a few more words on the subject.

The first fact I beg to remark on, is that of no two writers being agreed on any single incident concerning the blood-horse ; or the exception only holds in the statements and opinions of individuals and incidents. Nor is it anywhere shown what aims prompt the disputants, or what they wish to prove. No connection of ideas or workable system is shown.

Amongst the questions raised and most discussed, have been those concerning the relative merits of the English blood-horses of the present time and those of earlier epochs ; and also between the modern Anglo-Arabian horse and the native of the desert. Then it is argued, that making horses carry heavy weights, and run long distances, formerly guaranteed the cultivation of a stout breed ; and the departure from that course has brought about the reverse effect ; and lastly, that cross-breeding (a phrase unintelligible to myself, when applied exclusively to the blood-horse) is assigned as a cause of degeneracy ; which degeneracy, has yet all to be shown in the case of the blood-horse.

Dr Shorthouse, who, by the by, with his much learning, is difficult to follow through all his arguments, sets out, in a recently published paper, by saying that he thinks "each and every one of the disputants has missed the real point of the matter," and then he bespeaks "Admiral Rous and General Peel" to bear evidence in support of his, the Doctor's opinion, that out

of 2000 blood-foals annually produced, not more than two become really first-class horses." I shall be much surprised to see the two gentlemen appealed to subscribe to the above condemnation of the blood-horse of the present time; but as all are desirous to derive all the possible good from Dr Shorthouse's original ideas, it would be well to learn something of the meaning he attaches to some phrases used, as, for instance, what constitutes a first-class horse? since he says that this year we have only two of them, and that last year there was not even one.

The Doctor reminds us that just a century ago there was one horse produced amongst the comparative few at that time, of subsequently tried excellence, viz., Eclipse; and he asks, "How many from among the 2000 bred this year will be the equals of Eclipse? Shall we be able to count a single horse . . . have we, with our multiplication of numbers, kept up our proportion of horses of high class? If we have not, there can be no dispute that our horses have deteriorated."

The above questions are no doubt most pertinent to the inquiry; how far we may agree on the inferences to be drawn is another question. Eclipse was an extraordinary horse, such a specimen of his species as is not every year repeated; yet I believe that foals as good as Eclipse was, are frequently produced, but which never become his equal, because the mode of rearing, and whole after-management of them, is very different now to what it was then.

I agree with Dr Shorthouse, that "a sound six-year-old race-horse is now one of the rare things in England."

Speaking of the causes of deterioration, Dr Shorthouse describes these as consisting of two.

*Firstly*, "Breeding from horses and mares utterly worthless." On which point I hope we all agree.

*Secondly*, "Too much breeding." On this proposition and the arguments adduced in its support, I am impelled to take exception. On the assumption, that in cases where mares have produced many foals in yearly succession, and that the first is commonly the best, the Doctor mentions nine horses, foaled in different years, all the first produce of their dams, to show that they were the best of their respective families. Then he gives lists of horses which were the second foals of their dams, and of others produced after a barren season. The first series of these is designed to show that mares which had been in training required a year's rest before being put to the stud; the second is to show that breeding in alternate years only is advisable.

Neither experience nor the evidence which the Stud-Book affords, establish the conclusions drawn, and I believe that if one man seeks to prove that first foals are best, another, if he will only take the trouble, may find as many that were equally good of the third, fourth, or fifth produce.



To all of this I find about as much value should be attached as to any statement tending to show that the cleverest men are born on Mondays, when the only way to negative the notion is to go to the trouble of showing that just the same number of equally good men were born on Saturdays.

Van Tromp is claimed by Dr Shorthouse, as illustrative of his theory, that mares should only produce in alternate years, but unfortunately for his case, it escaped him that on the following year Barbelle produced De Witt, and the next year that extraordinary horse, the Flying Dutchman. Then Whalebone is cited to show the superiority of second foals, regardless of the fact that the renowned sisters of that horse, Web, Wire, and Wilful, with the brothers Woeful, Whisker, and Waterloo, were all produced in almost uninterrupted succession; and so great was their respective merits, that it is not easy to determine which of the number was really the best. Both Penelope and her sister Parasol, and their dame Prunella, tell altogether against the theory of first or second foals, or of alternating the years of breeding. Prunella produced 12 foals in 16 years, which were very equal in quality, and the last 6 were produced in annual succession.

More still to the point may be noticed the old Tartar mare amongst the past, and Pocahontas among the present, to show against the Doctor's theories on each of the three incidental aspects of first foals, of second, and of alternating years. The Tartar mare produced 16 foals, and the 13th and 14th were the renowned sons of Eclipse, Mercury and Volunteer; and Pocahontas produced Stockwell, Rataplan, and King Tom, in successive years, they being respectively her 5th, 6th, and 7th foals. Numerous instances might be cited, as they abound in the records of the Stud-Book. Crucifix, one of the best mares of this century, was the 14th foal, produced when her dam was 22 years old. For my own part, I feel justified in advising to breed from mares when they are three years old, or as soon after as they can be dispensed with from work; and to keep them and their produce systematically well, to wean the foals at five months old, and breed from the mares every year, unless, when late in the season, to stop in order to begin early the next year, and subsequently.

Experience shows that good horses run very commonly in families, on the side of the dam, proving the truth, that good mothers are essential to good offspring, as much as the soil is essential to the obtainment of yield, at least equal to the seed sown.

The last points to which we have to refer in Dr Shorthouse's paper, are those where he says, "*there are few strains of blood at the present time;*" I think it can hardly be considered out of place, if, in addressing a physiologist, I say that I am at a loss to discover what he means by strains of blood—Is it something mythical or real that is referred to?

Then, we are taught, for the first time, to regard such specimens of the English race-horse as Harkaway, Voltigeur, West Australian, and Plenipotentiary, as cross-bred horses; but I expect that the stewards of the Jockey Club will not ratify the definition, nor would the Courts of Law, in case of dispute on the wording of a contract.

The subject of horse-breeding seems to present itself as one of a kind that interests men generally, and yet each disputant, taking up a distinct view, sustains it with as much tenacity as if questions of individual responsibility or interest were depending on their solution, instead of the requirement of calm debate with the mutual help of all in the furtherance of common good.

Having devoted a paper to the "Breeding and Management of Horses," recently, published in the August issue of the *Review*, I shall confine my remarks in this, to particular phases of the question. On the relative merits of the English blood-horse of different epochs, I think it inexpedient to try to show more than is relevant to the subject of inquiry, or that can be spoken on with authority; and, therefore, taking the period of 150 years back from the present time, I am satisfied that English race-horses were in high perfection at the earliest period referred to—that their numbers progressively increased is also certain; and the last incident, in reference to numbers without care, tends to show increased status amongst the horses, because more winning racers appear as the records come nearer to our own time.

On the whole subject of horse-breeding, I find the two main questions so constantly mixed up as to confound inquiry, viz., that of blood or descent, and the cultivation of the produce. I can discover no evidence of either deterioration or improvement in the breed of the English blood-horse within a century past, but very important changes in the modes of their cultivation have taken place, within our own memory.

It has been argued, on ample evidence, that the English race-horse of old ran long distances, carried heavy weights, and often ran on to eight years old and upwards, and, I may add that he often walked over the course, and at last retired sound, and for no other cause, than that of there being no competitor to meet him. I do not believe that either carrying excessively heavy weights, or running severely trying distances, was a cause of improving the horses, but that the system adopted in their cultivation at the time enabled them to sustain such ordeals.

Attempts have been made to depreciate some renowned horses of old, by showing that they only ran few races in each season during their long career in training, and that they met only few horses, probably not more in their whole existence than a horse of the present day will encounter in two or three races run in the space of a month. Let us see what the case proves. Why, nothing to the purpose of our inquiry that I can see. In the times



of Childers, Eclipse, and Highflyer, there were not only few horses to meet, but there were very few race meetings, and these at long distances apart. Newmarket and York were the chief centres of the south and north respectively ; and such were the obstacles to the horses bred and trained at one part of the kingdom meeting those of the other, that the result was, small fields to contest the different races.

Hambletonian has been recently brought forward for comparison with the horses of the present time ; for what purpose does not appear, though the writers clearly set themselves to argue that that horse, and the whole class of his time, were not so good as accounts of them represent ; but if less pains were taken to lower the standard of comparison, and more given to the real work before us, some good might be expected from discussion. It is now said that Hambletonian never carried great weights ; but it is not denied that he ran and constantly won all his races, over five successive seasons, and the Stud-Book, in giving an account of his descendants, tells the rest. To try to lower the estimated worth of horses because their numbers were small compared to what they are, though they were good, is an evasion of the question of merit. That Diamond was bought for five hundred guineas is no proof that he was not an extraordinary good horse, as he was, worth a stableful of some such as we have seen bought for twice his price ; though he met one a little better than himself in Hambletonian.

More than one of the London sporting weeklies have just given a convenient list of all the winners of the St Leger at Doncaster, from the establishment of the stakes to the present year inclusive, to which I may refer. From 1776 to the year in which Hambletonian ran—a period of twenty years—the average number of horses entered for the St Leger stakes was 12, and of starters 7 ; in Hambletonian's race two less than the average started. In the next twenty years to 1815 inclusive, the average entry was 32 horses and a fraction over, and of starters 12. In the next twenty years up to 1835, the average entries were 72, and of starters 20 ; thence up to 1855, 116 was the average entry, and 11 and a fraction over was the number of starters ; whilst in the last nine years, including the present one, the average number of horses annually entered has amounted to within a small fraction of 172, and of starters a fraction over 13 ; the present year shows the largest entry and the lowest proportion of starters that has yet been recorded. Therefore the following two facts appear worthy of note—firstly, the progressive increase in the number of horses entered, and the decrease in the proportion of horses brought to the “ post ;” and further, it seems that in the present year Blair Athole and General Peel together, did what Hambletonian successfully did singly—deterred starters from going to “ post,” and reduced the field of horses to the low number.

In taking leave of this discussion, I beg to say that no period could have been less favourably chosen to draw comparisons from, between the blood-horses of the past and those of the present time than that taken, when Hambletonian was the first amongst the best horses on the turf.

The last ten years of the past century—the time referred to—was the period of all others when the English blood-horse may be said to have reached perfection; it was the time when many of the renowned horses and mares, whose names adorn the Stud-Book, were produced; the time when the sons and grandsons of Herod and Eclipse existed in greatest numbers, and highest form, and through which and the mares descended from Matchem, Marske, &c., the most successful blending of the different lines was accomplished.

Much stress is now being laid by writers, on the fact that Hambletonian did not carry heavy weights such as were imposed on horses a few years previously; they say he won his races under light weights.

On the above, I beg to make a few remarks—firstly, that whatever the weights imposed, since Hambletonian always carried the highest amongst the competitors of his age, in no way affects the merits of that horse. I believe that no good end is served by loading horses with heavy weights, and then sending them along at a pace incompatible with safety and preservation of the horse; and I have no doubt in the wisdom of the reformers of the crushing weight and four miles' heats practice, or of the humanity which dictated the promoting of that change.

The great purpose which the blood-horse has served, and for which, in a national point of view, he should be most esteemed, is for crossing with the other breeds of the country, by which means the best of horses for most uses are obtained. The chief tests of the merits of the blood-horse are trials of his speed and endurance,—and simultaneously the double purpose of proving the standard and relative merits of horses, and of affording scope for the most cherished of the national sports, is accomplished.

Coming to the abstract influence of weight as a test and means of keeping up the standard of perfection in horses, I believe the most inexact views are entertained on the matter. I approve of the raising of the weights for the Derby, and some other stakes, for three-year-old horses to eight stone ten lbs., as was adopted a few years since, because experienced jockeys are thereby enabled to ride without injuriously wasting; but as regards the horses, and a test of their individual and respective merits, these would be quite as effectually served by their carrying seven stone each, as under the penalties of higher weights.

I am sensible of my own exposure to the exclamation, that my views, put into practice on the matter, would enable slender, worthless horses to beat the robust and most powerful; while I



sustain that nothing of the kind would happen. Pace tries power, and with the lighter weight the greater speed would be brought out, while all the force of action and energy would be called forth. Systematic adjustment of weights constitutes the nicest part of the art of testing the merits of horses, and presupposes the most intimate knowledge of the subject, and is the part in which the English are distinguished for the exactness achieved above all other people.

In sustaining my position, I would invite the reader to entertain some comparative views; and, firstly, to the fact that, when in the pursuit of our national athletic sports, the pedestrian runs a well-contested mile race, or the member of the cricket club scores the greatest number of runs, we need not question whether the victor can carry—a knapsack or any other sack—these proofs having been brought out in the previous ordeal.

Again, let the coursing amateur answer, Does he find the slender puny dog, beat his finely developed animal of good proportions and weighty substance? or does the master of foxhounds disregard form in his pack any more than he does in his stable? I leave these questions open, though I know what the answers will be.

To obtain the blood-horse of the highest perfection for all purposes, we need not load him, to try whether we can destroy him and how soon,—a trial in which men can always succeed.

After all that has been said about the blood-horse, it should not be forgotten, that we were invited to consider the best means of augmenting the supply of horses of a totally different kind. The strong useful horses which have always done the chief work in the arts of peace and war, and which are most indispensable, are the kind of animal, we are informed from all directions, most requiring attention and improvement. The blood-horse, it is true, must not be lightly estimated, but the fact is that the latter has not only obtained the lion's share in the recent discussions, but no other class has been thought of any importance comparatively. I presume that the number of thorough-bred horses in the kingdom bears a relative proportion to all other breeds and classes of about one to two thousand.

There never was a time when, or a nation where, so much advantage was derived from crossing the breeds of animals of the same species as in recent years has been effected in this country. Formerly the dog and the horse were the most systematically attended to in this respect, and the practice of crossing was made of most avail in their species; but of late the horse has been greatly neglected, and every pretender to the smallest share of knowledge of the matter, talks of blood as if he knew all about the business. The fact is, that more size than the average run of blood-horses reaches to, is required for common purposes, and to fill the mind of agricultural breeders, that they must go all for

blood is to get so far as try—that long time may be required to get back to substance and power when the stock is changed. If horse-power be diminished in the individual animal, numbers must be increased to make up the loss; we may take the example of breeding animals for food: in the one case power, speed, and accompanying high quality is required; in the other weight and also quality. Some men might say that there is no meat like Welsh mutton; well! inquires the economist, but what about quantity?

Race-horse breeding is special of its kind, and as at present conducted most artificial and costly; and though not of trifling consideration in the estimation of good managing agricultural horse-breeders, it is a department that should take care of itself; and I believe that we as advisers in our sphere, should try to propound some workable system for improving, and above all, the means of preserving, horses in general.

---

### REPRINT OF REMARKABLE MEMOIRS.

---

*Scab in Sheep, and its Cure.* By ALEXR. BRUCE, Chief Inspector of Sheep for the Colony of New South Wales.

#### CAUSE.

THE scab in sheep, which is commonly known as an eruptive affection of the skin, very highly contagious, and accompanied with almost incessant itching, is caused by minute insects like horse mites, but smaller, called *acari*, which are conveyed from one sheep to another, principally either by actual contact or by being left in locks of wool on trees or fences on which scabby sheep have rubbed, and with which the clean sheep afterwards come in contact; and would seem, in Australia at least, to be propagated by contagion only.

#### SYMPTOMS.

*Although no indication is to be relied upon as conclusive evidence of scab, unless the insect which causes it be demonstrated,* the disease, according to the progress it has made, is always accompanied by one or more of the following symptoms, which should lead to its detection, viz. :—

*Change of Colour in the Fleece.*—The wool on the back, shoulders, or rump, appearing of a light colour, from rubbing, or that on the shoulders looking black or dirty, from the sheep scratching with its hind feet.

*Scratching or Biting.*—On watching sheep for a short time in which scab has existed for ten days or more, some of them will



be observed to turn sharply round, and bite or scratch themselves very suddenly and keenly; much more so than when affected with grass seeds, which also cause sheep to bite and scratch, but in a slow and lazy manner.

*Broken Wool.*—White tufts or locks of wool sticking out from the fleece on the shoulders, back, ribs, or rump. On the shoulders these are picked out by the hind feet; on the back and ribs, with the teeth; and on the rump, by rubbing on trees and fences.

*Changes in the Skin.*—The skin, especially on the shoulders and along the back, will be of a pale or bluish green tint, and will on these parts be gradually covered with pustules.

The skin of the affected parts, on being laid hold of, will feel thick and hard, and the wool knotty.

Scabs of various sizes will be formed on the infected parts, caused by the fluid from the broken pimples drying and becoming hard.

The points of the hams and flanks, as well as the shoulders and back, becoming scabby, and scabs and sores on many parts of the body, which is gradually denuded of wool.

#### ACARUS.

When seen through a common magnifier the insect appears to have a brown head and light transparent body, and looks like the louse, as seen with the naked eye, found at times on the human subject, but with the body longer, rounder, and more transparent, and with bristles or feelers at each end, which the latter insect does not appear to have.

*Detection.*—By the aid of a magnifier the insect may in warm weather be seen moving on the wool and on the skin, or on locks of wool plucked from the affected parts; but in cool days it will be necessary—unless the sheep be in a rather advanced stage of the disease—to pinch and scratch the affected portion of the skin with the nail or some sharp instrument to find the insect.

When, however, the insect cannot be readily found, the proper way to decide whether or not it be present, is to cut out a thin slice of the suspected portion of the skin, and having placed it between the glasses of a pressure-frame object holder, put it under the microscope (a pocket one will answer the purpose), and, if present, insects' eggs and excrement will be plainly demonstrated.

*Habits.*—On the *acari* reaching the sound sheep, their procedure is thus lucidly sketched by M. Walz:—"If one or more female *acari* are placed on the wool of a sound sheep, they quickly travel to the root of it and bury themselves in the skin; the places at which they penetrated being only distinguished by minute red spots, about the size of the point of a pin. On the tenth or twelfth day, a little swelling may be detected with the finger, and the skin changes its colour to a greenish blue tint.

The pustule is now rapidly formed, and about the sixteenth day breaks, and the mothers again appear with the little ones attached to their feet, and covered with a portion of the shell from which they have emerged. These little ones immediately set to work and penetrate the neighbouring skin, burying themselves beneath it, where they find their proper nourishment, and grow and propagate until the poor animal has myriads of them to prey on and torment it—every litter of the parasites comprising from eight to fifteen little ones.”

Some male *acari*, the same author states, “were placed on the skin of a sound sheep, where they too burrowed and disappeared for a time, and the pustule duly arose; but the itching and scab soon disappeared without treatment.”

*Nature.*—Both observation and experiment go to show that the tenacity of life in the *acarus* is very great, and its propagation marvellously rapid.

With regard to its tenacity of life, which is the characteristic principally affecting the question of a cure of the disease, the insect has been known to live for weeks in water, and for months in loose wool, or in such like situations, in a moist temperature; and there is no doubt but that sheep have received the infection from yards and trees in which the *acari* must have existed for several weeks after leaving the scabby sheep on which they were propagated. Besides, the eggs of the *acarus*, which are buried under the skin of the sheep, when the first dipping takes place, and from which the insect would only make its exit at a period of some nine to sixteen days thereafter, thus escape destruction, and would in due time come forth and propagate, renewing the disease, if not destroyed.

#### THE CURE OF SCAB—ITS PRINCIPLES AND HISTORY.

It will be seen, from the foregoing remarks, that it is necessary, in order to effect a permanent cure, *in the first place* that the sheep be dipped and re-dipped until the *acari* and their eggs are both thoroughly destroyed; and *in the second place* that the sheep, which have been thus thoroughly dressed, should, on their being so, be immediately removed to a clean run, or that such a thorough and lasting disinfectant should be used in the dressing, as would insure the protection of the sheep from the *acari* existing on the infected runs, for a period beyond that during which the insect could possibly live in any other situation than on the sheep.

In early days the former course was adopted, as there was then plenty of spare clean ground to which the sheep were removed on being dressed; and, if the medicament used was a curative, and the dressing a careful and thorough one, a permanent cure was effected.

As, however, the country became so thickly stocked as to render it impracticable to find fresh pasturage for such sheep, on their



being dressed, the other alternative (the employment of a lasting disinfectant with the curative) became necessary; and among other specifics for this purpose, sulphur was tried, but with so varied success that its qualities as a disinfectant of sufficient duration to outlive the insect were for some time very much doubted, and it was not till 1854, that Mr John Rutherford,—then of Hopkins' Hill, Victoria, and now of Messrs Quarterman and Rutherford, Wonwondah, Wimmera, by properly apportioning the quantities of tobacco and sulphur (one lb. of each to five gallons of water), and by dipping the sheep twice at an interval of from ten to twenty-one days, in a careful and systematic manner,—fairly established the character of sulphur as a lasting disinfectant, while he at the same time confirmed the belief in tobacco as a curative.

On the Hopkins' Hill Station, Mr Rutherford, with two dressings, then cured over 52,000 sheep, which had been infected for eighteen months, and he subsequently also cured, with two dipplings, the sheep on Mount Fyans' Station, where they were in a most wretched state, and had been scabby for more than three years; and that too, in both cases, without destroying a single hurdle or yard, or removing any of the sheep from their old runs.

Since then many hundred thousands of scabby sheep have been permanently cured in the same way in Victoria; and the process, as thus first followed by Mr Rutherford, and his mode of carrying it out, are here fully detailed.

#### ERECTION OF DIP YARDS AND APPURTENANCES.

*The Site.*—The proper site for a dip is on the bank of a creek or water-hole, where the boilers could be placed, so as that a pump could, by means of short spouts or pipes, lift the water into them. It would, of course, be necessary also to keep in view that the situation was such as would allow ample room for the erection of the necessary yards, and for bringing in and taking out the sheep.

*Receiving and Forcing Yards.*—The receiving and forcing yards, which may be of several shapes, should not be fewer than five in number, and it would be found to add to the convenience and to expedite the work to have even more.

The most complete style of receiving and forcing yards, however, is the circular form, planned by Mr Rawdon F. Greene, of Melbourne, and now in use in several parts of Victoria, both for drafting and dipping sheep. In this plan the habit of “ringing,” which all stock have when disturbed in a yard, is turned to account, and the sheep do of themselves to a great extent, and comparatively speedily, what any number of men and dogs can with difficulty accomplish in square yards.

In this plan there are so many yards, and their shape such,

that the sheep have not the same chance, even if they were so inclined, to pack and stop, as they have in the other form of yards.

Another habit, or rather instinct, of the sheep is taken advantage of, too, viz., the instinct which leads it to strive to make its exit at the place of entry; for the circular yards are so constructed, as that the sheep, when they get back to the gate at which they were yarded, would be close to the place where they were required,—at the entrance of the race leading into the dip. Thus the sheep are yarded at the entrance, which is, say, 4 hurdles wide, whence they find their way into yards Nos. 1 and 2 at the entrances. On these being filled, the gates into yards 3, 4, 5, and what, when all the gates are closed, is yard No. 6, are opened, and the sheep, expecting to escape at the gate at which they entered, will run round in a continuous stream, if properly managed, till yard No. 6, and say 5 and 4 also, are filled, when the gates of these yards should be closed. If the sheep be at all backward in moving, a man, by jumping suddenly over the fence, and running through the sheep in the opposite direction from that in which they are wanted to move (as is usually done in such cases), will start them off at once.

On the process of dipping being commenced, the gate across the mouth of the race at its junction with yard No. 6 will be opened, when the sheep will move into the race and thence into the dip. To accomplish this a narrow race is formed from forcing yard No. 6 to the dip, about 2 feet 3 inches wide and about 20 feet long, the last 5 feet of the flooring of which should be dressed quite smooth, and should slope into the dip at an incline of from 25 to 30 degrees, and the sheep on reaching the incline cannot stop themselves, but must slide into the dip. Where there is no natural fall in the ground, the slope is obtained by gradually raising the bottom of the race (which should be laid with cross battens to the commencement of the incline) till the proper turning point be arrived at. To prevent the sheep from jumping over the sides of the race, the fences on both sides of it, and especially as they approach the dip, should be of extra height, and they should also be extended for a short distance along both sides of the dip for the same purpose.

It will of course be seen that the fences of the smaller forcing yards, and those around the stage, in forms Nos. 1 and 2, should be of such a height and strength as will render it impossible for any of the sheep to break away, and it would be more convenient, as well as more secure, were slide-gates fitted up at the several gateways, where they can be so, instead of hurdles. When the sheep are clean these yards and gates could be turned to account in the erection of drafting or other yards; and if erected in the circular form and conveniently situated, they might, even as they stand, when free from infection, be turned to use as drafting



yards, by making the race about ten feet long, instead of twenty, and adding the necessary swing-gate and yards.

Although the circular receiving and forcing yards are specially adapted for the working of Dip No. 3, they may be used for any form with very considerable saving of time and trouble; and it is for that reason that they have been here so minutely described.

*The Stage.*—In forms Nos. 1 and 2 a stage around a portion of the dip will be necessary. If a tilt is to be used for throwing the sheep into the mixture, the stage would occupy only a small extent of the frontage; while, if they are to be thrown in by hand, it will require to be of sufficient size to hold about fifty sheep, and to be so constructed around the dip, as will allow the men ample room to work in throwing in the sheep without extending too far around the sides, or too far back from the dip. There should, in that case, also, be fittings at intervals along its extent to allow of a hurdle being put up, where required, to confine the sheep, as the number on the stage becomes fewer, so as to prevent them from running about when being caught.

*Blinds.*—The fence at the back of the stage should be blinded either with bark or with sacking, to keep the sheep in the yards from seeing the stage and dip; and a blind of sacking, such as is sometimes put up at sheep-washes, to work on a roller like a window-blind, should be erected on the edge of the stage next the dip, to hide it from the sheep till the stage is full.

In the circular form (No. 3), instead of the rolling blind, as in Nos. 1 and 2, a piece of sacking fixed across the race, at its junction with the dip, which would be loose at the sides and bottom, and would fall back into its place as the sheep dropped into the dip, is all that is required by way of a blind.

*Decoy-Pens.*—These are necessary, in forms Nos. 1 and 2, to save time in putting the sheep on the stage; and should be so placed as that the sheep, looking to the entrance from the forcing yard to the stage, and from this again to the farther end of the stage, would have a full view of those in the decoy-pens.

*The Dip.*—There are several forms of dips in use in Victoria and South Australia.

No. 1, the form first used, and still generally so, is round, about 9 feet deep in diameter, and 8 feet deep in the clear, with draw-gate  $4\frac{1}{2}$  feet wide to work up and down in grooves in the side of the race, from the dip to the draining yard. This race should be of the same width as the draw-gate, and from 10 to 15 feet in length, starting at about 2 feet from the bottom of the dip, and sloping up towards, and to a level with, the bottom of the draining yard.

It will be seen that it is an object to obtain the exit of the sheep as quickly as possible from the dip, so soon as the overseer is satisfied that they are properly dressed; and it is to attain this

end that the draw-gate and race to the draining yard are made so wide.

No. 2, a more recent form of dip, is of an oblong shape, from 20 to 25 feet in length, about 4 feet wide at the end next the stage, and gradually becoming narrower till it is 2 feet 3 inches wide at, say, 12 feet from the end next the stage, and continuing that width to a pine-float or draw-gate erected at the junction of the dip and race to the draining yard, which should be of the same width as the narrow portion of the dip, and about the same length as in No. 1.

No. 3 is the form used with the circular receiving and forcing yards, and is the same as form No. 2, except that it is somewhat longer, and of a uniform width of 2 feet 3 inches throughout.

In whichever of these forms the dip and race are constructed, they may be either of pine tongued and grooved, or of colonial timber sawn or in slabs. If the former be used, puddling may be dispensed with, although it would be advantageous in many cases. If the latter, it will be absolutely necessary to puddle all round and below the dip and race to a thickness of 2 feet, and in that case, also, to secure the slabs with stays attached to posts, put well into the ground behind the dip.

There should be a depression at the bottom of the dip on the side next to the boilers, for collecting the mixture, when it is required to be cleaned out.

In order at all times to know the depth of the mixture in the dip, it should be gauged and marked at, say, every 3 inches, and the number of gallons corresponding to the different measurements should also be marked on the sides.

Movable water-tight covers should be made for the dip and race to the draining yard; or where bark is plentiful, and a large number of sheep are to be dressed, it might be well to put a roof over the dip and race, which would render water-tight covers unnecessary.

*Gangway to Draining Yards.*—On the bottom of the race leading from the dip to the draining yards a framing of battens is to be placed, so constructed as to give the sheep foot-hold to get out of the dip, and to allow the mixture to run back into it from the draining yards.

*Draining Yards.*—These are to be constructed to hold from 200 to 300 sheep each, and they should be at least two in number, so as that in turning out the sheep after dripping, those that are newly from the dip may not be turned out with those that are thoroughly dripped. The bottom of the draining yards (which should have an incline from all sides to the race and dip) should be lined throughout, the same as those of the race and dip; and over it is to be placed a grating of battens, with the supports so laid down as to allow the drainage from the sheep to flow from all parts of the draining yards into the race and dip.



A movable sluice-gate is to be constructed at the junction of the draining yards with the race from the dip, and a spout or pipe is to be affixed to an opening from that to a point clear of the dip, to run off any rain-water that might gather in the draining yards, and prevent it from flowing into the dip. When in work the sluice-gate would of course be removed, and the opening to the spout or pipe closed.

#### BOILERS AND UTENSILS.

*Boilers.*—Two square boilers, each capable of holding 400 gallons, for heating water, and three round ones of from 80 to 120 gallons each for infusing the tobacco, would be sufficient for a station with from 20,000 to 40,000 sheep. The boilers to have taps to which iron spouts or pipes are to be attached, to carry their contents into the measure, and thence into the dip. Although the infusing boilers are here put down at from 80 to 120 gallons, it would be more convenient, but of course more expensive, that larger, say 150 to 200 gallon boilers, should be used. All the boilers should have covers; and it is essential that those on the infusing boilers should be perfectly air-tight, to prevent the escape in the steam of any of the curative properties of the tobacco while it is undergoing the process of infusion.

*Pumps.*—There should be a pump (one of common sheet-iron would answer the purpose) to supply the water required from the creek or water-hole to the boilers and dip. It would also be convenient to have a bucket-pump for drawing the mixture, when required, from the dip.

*Measure.*—In filling up the dip it is most important that the exact quantities of liquid added from time to time should be known, and for this purpose a cask, gauged and marked, should be placed between the boilers and the dip, with both of which it would communicate by means of spouts or pipes; and all liquids of every description should be passed through the measure before going into the dip, so as that the quantity added might in every case be correctly measured.

*Crutches.*—The head of the crutch, which should be about 12 inches long, should be made of half-inch round iron, bent so as either to pull or push, something in the shape of an elongated letter S, with a handle 7 feet long attached to the middle of the head. Where iron cannot be got, a wooden crutch will answer the purpose, although not nearly so well.

#### PREPARING THE MIXTURE.

*Infusing Tobacco.*—Supposing that the quantity to be dipped in is 2000 gallons, and that the infusing boilers are of the sizes mentioned, it will be necessary to begin to prepare the mixture two days at least before the dipping is to be commenced; and the infusing of the tobacco is, at the beginning of the process, to be

carried out exactly in the same manner as tea,—boiling the tobacco in the first water being carefully avoided. Thus 400 lbs. of good imported manufactured or leaf tobacco (that is, 1 lb. to 5 gallons of water, and it ought never to be less) is to be weighed out, and the infusing boilers having been nearly filled with water, and the water brought to the boiling point, the fires are to be removed from under the boilers, from 80 to 120 lbs. of tobacco are to be put into each of them, and the covers carefully adjusted, to prevent the escape of any of the steam, which as already stated, would carry off with it some of the more active curative properties of the tobacco. In eight or ten hours draw off the infusion, and add fresh water to the tobacco in the boilers, which boil gently for two hours, keeping the steam from escaping, and draw off a second time, leaving the tobacco again in the boilers. To this add a third water, and boil for two hours more in the same manner, when the strength of the tobacco will be thoroughly exhausted. Carefully repeat this process of infusing and boiling, till the proper quantity to commence dipping with be made up.

Of good sound colonial leaf tobacco it has been the practice to use from one-half to three-fourths more than imported to the same quantity of water; and, although there likely is not actually this difference in the curative properties of the two sorts, it is safer, until the matter be thoroughly tested, to use the larger quantities of colonial tobacco.<sup>1</sup>

During the dipping every care should be taken that no water, either hot or cold, is added to the dip beyond what is necessary to maintain the mixture at the proper strength; and when more tobacco is required to replenish the dip, it must be carefully weighed out according to the scale given above, and is to be infused and boiled in exactly the same manner as now detailed.

*Mixing Sulphur.*—Weigh out 400 lbs. of sulphur (*i.e.* 1 lb. to 5 gallons of water), of which put, say, 100 lbs. into a tub or vat half filled either with the tobacco-water from the infusing boilers, or with cold water, and stir and break the sulphur till it be thoroughly mixed with the water, when it is to be poured into the dip. Repeat the process until the proper quantity of sulphur has been added, and, when requisite, replenish, as the dipping proceeds.

#### SPOTTING.

Although this practice is not absolutely essential, the safer and more prudent course to pursue is either to spot those sheep that are badly diseased, or to dip them in strong and hot tobacco-water, say 1 lb. of best tobacco to four gallons of water, at a temperature of fully 110°, on the day before the regular dipping is commenced, which they would of course also undergo.

---

<sup>1</sup> See Analysis of Tobacco, page 609.



In spotting it is not necessary to scarify, and the best way to spot is to select the more badly diseased sheep on the day before they are to be dipped, and put them into a yard by themselves. Then one man should hold the sheep either on its side, on the ground, or standing up, and open the wool over the affected parts, while another pours an extra strong and hot tobacco-water, from a coffee-pot or such like vessel, on to the parts thus exposed, and beats and rubs them with his hand to cause the wool to absorb the mixture. The sheep that are thus treated are kept in the yard during the night, and run through the dip with the others next day.

#### DIPPING.

*Mode of Operation.*—In order not to lose time in the morning waiting for the mixture to be ready, the large boilers should be filled with water the night before dipping is to be commenced, and fires lighted under them, which should be replenished by some one during the night.

As early as possible in the morning add boiling water from the large boilers to the mixture of tobacco-water and sulphur, which has been prepared and put into the dip, until the proper quantity be made up, and until the mixture be of the right strength and at the proper temperature.

Supposing that the plan of the dip is No. 1, and that the sheep are in the receiving yards, and also that the pumps and other conveniences are complete, six hands besides the overseer will be amply sufficient to carry on the work—that is, one man to yard, two men to throw in the sheep, two men to crutch, and one man at the boilers, while the overseer would take his stand at the gangway to the draining yard, where he can overlook and control the process. It is necessary that all the hands should be men to be depended upon, but especially the party at the boilers, who should be both active and intelligent; and the same hands should stick to the same posts throughout.

The stage having been filled with sheep, and the dip with mixture to within 12 inches of the top, the men on the stage will commence and throw in any number which the overseer sees can be attended to at once in the dip. In the circular form of dip (No. 1), the sheep on being thrown in will generally make for the draw-gate, when the overseer with his crutch will turn their heads, and make each sheep swim say twice round the dip, the crutchmen in the meantime using their crutches upon them, and putting each sheep not less than twice over head in the mixture. When the sheep have had enough they are guided towards the draw-gate, and put out by the overseer, when he is satisfied, into the race, whence they soon find their way to the draining yards.

With dips made on the Nos. 2 and 3 principles, the process

of putting the sheep into the mixture, and treating them there, will be somewhat different from that to be followed in No. 1. In Nos. 2 and 3, the supplies of sheep will require to be much less at a time, but more frequent and steady, so as to allow the work to proceed regularly and quickly, while the sheep are at the same time kept sufficiently long in the mixture. The crutchmen might not be able in these dips to give the sheep much of the crutch ; but, being stationed at different points along the dips, they would be able to immerse each sheep twice completely over the head in the mixture, and the rest of the body oftener ; while the length of the dip would insure the sheep being sufficiently long in it for the dressing to take a proper effect.

As the mixture diminishes a fresh supply has to be made of the proper strength and heat, and, while there are many sheep to be run through, it should be kept as near the top of the dip as possible, for the nearer the sheep are to the men the more efficiently will they be able to use their crutches on them. In any case it should never be allowed to become lower than 2 feet 3 inches in depth, otherwise there would be a risk of breaking the sheep's legs in throwing them into the dip.

Although 3000 and even 4000 sheep might be dressed in a day in such a dip as that described, the hands ought not to be hurried or bustled, and 2000 is at first a sufficient number to run through in one day. This ought to be accomplished early in the afternoon, when the men can be employed preparing mixture for the following day ; and the fires should during the dipping be kept up through the night.

When all the sheep have been dressed the mixture should be put into the dip, which with the gangway and race to the draining yards should be covered up, and the sluice-gate put in, and the spout or pipe opened at the junction of the gangway with the draining yards.

*Duration and Heat of Bath.*—When the fleece is short the mixture should be used at a temperature of 110° Fahrenheit in the winter, and at 100° in the summer, at which it should be the endeavour to keep it throughout the dipping (the thermometer being tried, say, every second dipful), and the sheep should be allowed to remain in the dip from 50 to 70 seconds ; for with short fleeces they dry almost immediately after being put into the draining yards. As the mixture gets cooler it will be necessary to keep the sheep longer in it, say from 1½ to 2 minutes altogether, but in no case should the temperature be allowed to fall below 85°.¹

When the fleece is long, the heat of the mixture should be maintained at a temperature of from 90° to 95° in the summer,

---

¹ While it only takes 30 seconds to kill the scab insect, with the mixture at 90°, it will live for ten or twelve minutes in the same mixture at 45° to 50° Fahrenheit.



and from  $95^{\circ}$  to  $100^{\circ}$  in the winter; and the sheep should be kept in the dip nearly, though not quite so long as when the fleece is short.

Although, however, these periods are given by way of a guide, for the purpose of timing the process, *which ought to be carefully attended to*, it will be for the overseer to attend and see that, while the sheep are all thoroughly saturated, none of them are kept so long in the mixture as to run the risk of their being drowned.

*Management of Sulphur.*—In putting through the first and second dipfuls of sheep, it was at first found that some of them were killed, as has been generally supposed by the fumes from the sulphur, which, when allowed to do so, collects, at the commencement of the dipping, on the surface of the mixture; and the practice has been to keep the mixture well stirred up till the third or fourth lots have left the dip. This answers the purpose (although it is very doubtful if the deaths occur from the cause to which they have been attributed), and when attended to, there are few or no deaths.

It is very necessary, too, that the sulphur should, as the dipping proceeds, be kept stirred up from the bottom, so that each sheep may carry away a sufficient quantity of it in the wool.

*Second Dipping.*—One dipping, if carefully and thoroughly performed, as directed, may make a cure; but the practice ought always to be to dip twice at an interval of from ten to twenty days to make the matter a certainty; for not only will any sheep, which may have been imperfectly dressed at the first dipping, be thus certain of being thoroughly so at the second, but all the *acari* which were then in an embryo state in the skin, and thus escaped destruction, would, by the time the second was carried out, have reached maturity, without having had time to propagate, and would be destroyed.

*Dipping Stragglers.*—Although it should happen, as it is to be hoped it will, that the two dippings effect a cure, the use of the dip will not then cease, for in or near a district where scab has existed it ought to be an established rule with the sheep-owner, for at least twelve months after the last case of infection in or near his neighbourhood, *that every sheep which has strayed off his run, or has mixed with those belonging to other runs, should, on recovery, be carefully dipped either once or twice, according to the character of the ground on which it was found, or of the sheep with which it had mixed.*

When there is no mixture in the dip it should be filled with water, to keep it in a serviceable state.

Although not absolutely necessary to do so, it is a good plan to put sheep from the dripping yards into their own infected yards, so that the fences and trees there may receive a coating of the mixture from the fleeces of the sheep pressing against them.

*Portable Dip (No. 4).*

For stations with no more than say 5000 sheep small portable dips made of pine tongued and grooved, or of zinc, would answer the purpose; and, if necessary, might, with the requisite boilers and utensils, be removed from one station to another, on bullock drays.

Such a dip would be about 4 feet wide,  $4\frac{1}{2}$  feet deep, and about 6 feet long at the bottom, lengthened to about 9 feet at the top, the difference in length arising from the extension of one of the ends to form the necessary race and gangway to the draining-yards, and there should be a bar or pine-float across the gangway to keep the sheep in the dip, till they are sufficiently saturated with the mixture.

When filled to within one foot of the top, such a dip would contain about 600 gallons; and, in order to strengthen it, as well as to facilitate the throwing in of the sheep, the dip should be let into the ground till its mouth is below the level of the floor of the stage.

The forcing and receiving yards, stage, draining yards, and other appurtenances would be made of proportionate sizes, and would, of course, be of a temporary nature.

In such a dip there would be ample room for three sheep at a time, and five hands—one yarding, one at the boilers (which should be about one 100-gallon boiler and one large pot of, say, 30 gallons), one throwing in, and two, including the overseer, crutching and letting out the sheep, would be able to thoroughly dip more than 600 sheep a day.

## RECAPITULATION.

Although nothing is more certain than that the process now detailed is not only a positive cure, but also an effective disinfectant (which it would seem that other medicaments which effect a cure are not), it must be continually borne in mind, that, if one sheep be omitted, or is insufficiently dressed, the greater part of the labour may be lost. It is imperative, therefore, that the utmost vigilance be exercised by the person in charge of the dipping, that it is correctly and carefully applied to every sheep on the run. *It is utterly needless for careless sheep-owners or superintendents to attempt to cure sheep of scab.*

To those, however, who will take the necessary pains, but who are as yet but little acquainted with the process of dipping, it may be useful to mention shortly the chief causes of the numerous failures which have occurred in the attempts made to cure sheep with tobacco and sulphur. They may be enumerated as follows:—

1. Leaving sheep, and especially crawlers, which are unable to follow the flocks to the dip, out on the run, and thus omitting to dress them. Before dipping is commenced, every sheep of this



description should be killed and burned; and a careful account should be taken some three or four times at least immediately before dipping of all sheep on the run, to ascertain beyond the possibility of a doubt their actual number, with which the number dipped *must* be made to tally exactly.

2. Using inferior tobacco. There will be little or no difficulty with respect to the quality of imported manufactured or leaf tobacco; and the colonial leaf must be well sweated, tough in texture, and strong in flavour.

3. Omitting to keep the mixture at the proper strength and heat. The overseer, until he can thoroughly depend on the man at the boilers, must see personally that the proper quantities of tobacco and sulphur are weighed out, and that the replenishing of the dip and heat of the mixture are correctly attended to.

4. Neglecting to spot or dip in strong tobacco-water those sheep which are very badly scabbed.

5. Allowing sheep to pass from the dip before the mixture has been thoroughly applied to them, or before it has had time to do its work, especially as it becomes cool; and

6. Neglecting to re-dip within the proper time.

It must, in conclusion, be remarked that a great deal of the success depends upon the plan of the dip and yards, and on the convenience of the other arrangements. In the foregoing directions these subjects are fully discussed and ample instructions given for successfully carrying out the cure in several ways; but, although they are so, the sheep-owner, in determining the form of yards and dip which he should adopt, ought to bear in mind that certainty of effecting a cure is the object to be aimed at, and should adopt the form by which he sees he can best attain this end, although the dipping might thereby be comparatively tedious and expensive.

#### OTHER SPECIFICS.

With the forms of dips and appurtenances here given any other medicaments might be used; but, as yet, no dressing or specific has either in Victoria or New South Wales, when used on stations on a large scale, been generally so effective as tobacco and sulphur; and it was tobacco and sulphur which eradicated scab in South Australia.

At home, too, and on the Continent of Europe, the faith in tobacco as the best curative for scab in sheep is still unchanged, as may be gathered from the following extract from the "Scottish Farmer" of 10th February last: "Preparations of tobacco have as yet been recognised as the best for the destruction of the scab insect. Professor Gerlach, Director of the Veterinary College, Hanover, accords them the first position for this purpose, and farmers in this country seem to agree on this point."

Preparations of corrosive sublimate, arsenic, sulphuric acid, and of other highly poisonous ingredients which have been and still to some extent are used as medicaments for the cure of scab should be avoided for the following reasons: They are liable—

1st, To poison the sheep. 2d, To cause them to lose their teeth, and even to hurt their constitutions. 3d, To bring on sloughing and ulcerations which frequently carry numbers of them off. 4th, To cause great loss of wool. 5th, To occasion painful sores and even deaths among the hands dipping or dressing; and, 6th, To be the means (through carelessness in the parties using the poison) of causing the death of animals and sometimes even of human beings.

---

APPENDIX.

*Analysis of Colonial Tobacco.*

ASSAY OFFICE, 222 PITT STREET,  
SYDNEY, 4th June 1864.

SIR—I have examined the two samples of leaf tobacco, the produce of the Colony, which you sent me on the 23d ultimo, with the view of ascertaining the value of colonial tobacco as a curative for scab in sheep, compared with the American article.

One of the samples sent me, which is said to have been grown on the “Allen,” is a very good leaf and fairly cured, while the other, which was grown on the “Hunter,” is coarser and not so well prepared. Taken together, however, I consider them an average of our colonial tobacco.

On examination, I found these samples contained *as nearly as possible the same quantities of nicotine as the coarser kinds of imported American tobacco*, which I have analysed; and these quantities correspond also with those already ascertained by me in other samples of colonial leaf.

As the quantity of *nicotine* (the property in the tobacco upon which you are to rely for the destruction of the scab insect) depends much upon the manner in which the sweating and curing of the tobacco is performed, as well as on the mode of culture of the plant; and as these processes are comparatively new in this colony, and frequently but badly carried out, I would recommend that in apportioning the tobacco in dipping sheep for scab, the allowance should, in the absence of an analysis, be most liberal to avoid disappointment,—say of colonial tobacco from one-half to two-thirds in excess of first class imported.

Tobacco stems I have analysed, and found them to be all but totally unproductive of nicotine, and therefore useless as a curative for scab.—I am, Sir, your obedient Servant,

ALEXANDER BRUCE, Esq.,  
Chief Inspector of Sheep, Sydney.

(Signed) J. S. NORRIE,  
*Analytical Chemist.*

---

*Probable Cost of Dips 1, 2, and 3, and Appurtenances, with Carriage from Sydney, at say 14s. per cwt.*

Materials and cost of erection of stage, race, dip, and draining yards (including carriage of material), say . . . . .	£40 0 0
Materials and erection of receiving and larger forcing yards of brush, and the fences around the stage, and 2 smaller forcing yards of saplings (including carriage), say . . . . .	10 10 0
	<hr/>
Carry forward,	£50 10 0
	4 H



	Brought forward,	£50 10 0
2 Square boilers, each 400 gallons, at 140s. . . .	£14 0 0	
Carriage of both, 7 cwt. at say 14s. . . .	4 18 0	
3 Round boilers each 100 gallons, at 100s. . . .	15 0 0	
Carriage of 3 = $7\frac{1}{2}$ cwt. at say 14s. . . .	5 5 0	
	<hr/>	39 3 0
Crutches, spouts, pipes, pump, buckets, measure, &c. say . . .		10 7 0
	<hr/>	£120 to £100 0 0

*Probable Cost of Portable Dip, No. 4, and Appurtenances.*

1 Zinc dip and wooden frame . . . .	£10 0 0	
Carriage—say = 3 cwt. at 14s. . . .	2 2 0	
	<hr/>	£12 2 0
1 Receiving and 2 large forcing yards of brush, fence around stage, and 2 small forcing yards and draining yards of saplings (including carriage), say . . . .		7 10 0
1 Round boiler, of 100 gallons . . . .	£5 0 0	
1 Large pot, of 30 gallons . . . .	1 10 0	
Carriage of both = $3\frac{1}{2}$ cwt. at say 14s. . . .	2 9 0	
	<hr/>	8 19 0
Crutches, spouts, pump, buckets, and measure, say . . . .		5 0 0
	<hr/>	£40 to £33 11 0

*Price of Medicaments.*

Good sound colonial leaf (no imported to be got), say from 6d. to 9d. per lb.  
Sulphur, 3d. per lb. in Sydney.

# EDINBURGH VETERINARY REVIEW

AND

## Annals of Comparative Pathology.

---

### MARKET INSPECTORSHIPS.

VERY few men, indeed, can retain their individuality in a crowd. A dissentient hearer is carried along perforce by a speaker, whose audience is loud and enthusiastic in applause. Wheresoever twenty men are assembled, the majority of them will probably lean to foolishness ; and if the majority be united and obstinate, the wisdom of the minority will be frustrated or extinguished. It is this condition of humanity that explains the want of brains and bowels, as evinced in the general dealings of corporate bodies. We are gregarious beings. A dozen of sheep will stand terrified on the threshold of a slaughter-house ; but if one of their number be got across the slippery floor, the rest will follow through the blood, to be transformed unsuspectingly, almost unresistingly, into mutton. A few bold, and perhaps foolish, members of a Council will very often draw their fellows into the performance of actions from which even the boldest and most foolish of the prime movers would shrink, if the responsibility rested entirely on his own shoulders. In the multitude of counsellors there is safety—to the counsellors. Where is Wisdom to be found, and where is the place of Understanding ? is a very ancient query. Were we asked where Wisdom is not to be found, we should find a ready answer, on reflecting upon recent proceedings of our respectable but not infallible Town Council.

Public attention has of late been forcibly drawn to the consideration of the dangers accruing to the public from the widely extended, and by no means secret, traffic in diseased meat. Salesmen and butchers are the only parties that could possibly derive a profit from the continuance of such a traffic. When, therefore, the Edinburgh Town Council, in a wise moment, had determined upon the appointment of inspectors, for the purpose of checking or annihilating this public nuisance, we should hardly have sup-



posed that, in a foolish moment, they would have selected the majority of these officers from out of that particular class which alone can profit by its continuance. Had the successful candidates been tinkers, tailors, or ship-carpenters, we should then have rested our objections solely upon their presumed ignorance of every detail connected with their new calling; but still we should have enjoyed the comfort and satisfaction of knowing that their interests were at one with those of the general public, and that they had now particular and specific reasons for acquiring information and enlightening their former ignorance.

Supposing it were possible that any underhand practices in the hosiery trade were threatening the public with the wide-spread diffusion of inferior flannel and perishable stockings, and a committee of inquiry were instituted; no single hosier could reasonably expect a place on such a committee; at all events, we should demur to the *majority* being selected from the supposed offending trade. In the matter, however, of Meat Inspectors, the Town Council of Edinburgh has, for mysterious reasons, acted precisely in the manner that we have presupposed improbable or impossible in our imaginary case.

Proofs numerous and incontestable have been adduced that a certain traffic has long existed and still exists. The most eminent medical men of Scotland have formally stated that such a traffic is fraught with danger to the general health of the community. When inspectors for its repression were called for, common sense would have suggested that the qualifications for this office should have been *certified intelligence* and *probable impartiality*.

With regard to the former requisite, it would be very curious indeed, if the certificates of the favoured candidates had been entirely satisfactory. At all events, in our experience, we have never had the good fortune to fall in with a single butcher that had busied or amused himself with the use of the scalpel or the microscope. It is certainly possible that the favourites of the Town Council differ in respect to scientific acquirements from the majority of their brethren; but there is nothing in their testimonials to justify us in the charitable belief. These testimonials only prove that, with all their respectability, they are, or have been, butchers; honest, but, apparently, inferior and unsuccessful butchers. Indeed, from all we can gather from

their testimonials, we should be disposed to think that these respectable men will be found about as well qualified by an insurmountable ignorance for the performance of certain of their duties, as the majority of those intelligent Councillors who appointed them to their offices.

With regard to the second and very important requisite, we can only say that the civic patrons either never expected it of their *protégés*, or that, if such an expectation were formed, these poor *protégés* were treated with unkindness and injustice. We should have been disposed to argue that butchers, after all, are but men, and incidental to all the weaknesses of humanity. We should have supposed it very improbable that the edict of any council could in a moment divest a butcher of all sympathy with his fellow-craftsmen. There is said to be a kind of honour among thieves: is there none among butchers? We have heard of the *odium theologicum* and the *odium medicorum*; but no butcher has as yet been known to make mince-meat of a brother.

However, it is quite possible that, in the recent nominations to office, the Council were acting upon the old adage, "Set a thief to catch a thief." Indeed, this is the only supposition that can colour their proceedings with a semblance of common sense. But, if the presumption be correct, observe how the Council, in their efforts to benefit the public, have insulted a respectable trade. Is it for a moment to be supposed that a butcher is inferior in brotherly feeling to a member of any other trade or profession? Is there justice in that old English law that debars a sticker of sheep and a feller of oxen from a seat in the jury box? Heaven forbid. Let us trust that the newly appointed butchers will be gloriously false to their patrons, their charge, and the interests of the public, and will, in the true spirit of butcher-brotherhood, wink kindly upon the peccadilloes of their sorely tempted brethren. It is true, the public will suffer a little—a fever or two may be propagated in the Canongate; but our Town Councillors live in cleanly neighbourhoods, and dine upon unquestionable meat. Meanwhile, our poorer brethren must look after themselves: they have been so long used to bad meat, that it is possible they would now purchase it in preference to good. So, success to the New Inspectors, and bother the public.



## CORRESPONDENCE.

—o—

*Letter on Laminitis and Navicular Disease.*

MY DEAR SIR,—Since hearing the very excellent and instructive paper upon Laminitis, read by Mr Secker of Knaresborough, and the thoroughly practical discussion which followed it at the last meeting of the Yorkshire Veterinary Medical Society, I have felt a deeper interest, if possible, in the subject, and a stronger desire to know more and more about it. I am persuaded there is yet much to learn, and with that object in view, I beg leave respectfully to suggest, that we dispassionately and deliberately examine the subject. This proposition I make with every feeling and sentiment of respect to you, more especially so since I find we entertain different opinions upon these diseases, and by reasoning these views out to their legitimate source, some light may thereby be thrown upon it, and sound principles advanced.

## LAMINITIS.

The opinion I entertain upon the subject of Laminitis is, that in by far the greater majority of cases there exists in the animal so affected a congenital tendency. That this tendency has been gradually assuming a condition more and more favourable to lameness for some time before actual lameness has shown itself; that the economy and condition of the bony structures have been undergoing a certain change, and this too in the absence of any active inflammation—a sort of atrophy. We know there are diseases which may go on in bone for a considerable length of time without producing much, if any, suffering, but in which, on arriving at a certain stage or condition, some simple exciting cause shall develope most severe suffering. As is the case in those diseases of the metricious type, mollities, or fragilitas ossium, &c., the causes of which are buried in obscurity, but are supposed to depend upon some peculiar state of the constitution, such as a defective supply of the phosphate of lime in the bony texture, or it may be an inordinate absorption of this material, causing the bone to lose much of its natural firmness, it is unable to sustain the superincumbent weight; an alteration or change in the arrangement of bony lamellæ in the coffin-bone, it becomes more shell-like, attenuated at its edges, bulging on its under surface, or pumiced, and all this irrespective of any disease going on in the lamina; in fact, the author of the essay observed,—“The subject of Laminitis has been observed to go shuffling and getting worse gradually for some time previous to the attack.” In my papers in the “Veterinarian” for 1855, I term this “the passive stage,” and it is in this particular condition that

is the crisis. Any little extra circumstance, such as a change in keep, a cathartic dose, the act of shoeing, some extra knocking about, standing still a little too long in the stable, anything or nothing, in fact, is sufficient to produce the active stage as unmistakeably as is a twinge of the gout or toothache in the human being. Have we not fact upon fact, and proof upon proof, of various organs degenerating, and are we to suppose that the plantar organs are wholly exempt from those very laws which we see almost every other organ in the animal economy is liable to. We see the brain undergoing a process of degeneracy, a softening; this, too, in the brain of men of apparently strong minds, clear headed, sensible men up to a certain age; the exact period very much depends upon being subjected to favourable or to unfavourable circumstances. The subject of the disease is observed to become by degrees rather crotchety, eccentric, and in the end, slight sudden shock to the nervous system develops imbecility or unsoundness of mind, or in other words, active laminitis. You may see one man in remarkably easy circumstances, never having passed through trials, the functions of the brain become impaired, and by degrees he becomes of unsound mind, whilst another man can contend with every variety of trying circumstances; he can sustain the most violent shocks from the most dire calamity, but notwithstanding this his reason firmly retains her seat. How is this? It is simply attributable to a difference in constitutional tendency. We have another disease, degeneracy or softening of the liver, ramollissement, degeneracy or wasting of the lungs, phthisis; in each of the particular subjects liable to these complaints a specific special tendency exists, it is an irresistible, an uncontrollable diathesis continually drifting towards one single destination; in each individual, for instance, the true subject of laminitis is almost certain to be exempt from any tendency to formation of bone-spavin, side-bone, ring-bone, splent, &c. You may possibly insist that bony structures are entirely and altogether different, and are not liable to the same laws in the animal economy as the soft organs, and which are illustrated above; to such objection I reply, that we have no right to assume such to be the case. I believe bony structures are liable to morbid affections equally with other tissues. Is not each organ in itself, in fact, every tissue in the whole body (unless defectively formed in the womb) wisely ordained, adapted exquisitely and perfectly for the duty or function it has to perform? They are, when in health, each perfect in itself—the one not more so than the other—they are each equally subject to decay and reproduction; and whenever natural action is perverted or nature is over-taxed, the delicately fine natural susceptibilities are acted upon and interfered with in the one case like unto the other, and nature suffers, her functions and actions are thwarted, reproduction is retarded, and after



a while that organ, whichever it may be, becomes unequal to the task, and the natural result is lameness, if it happen to be in the plantar organ, or imbecility if it happen to be in the brain. In both cases, properly speaking, it is the language of pain, or the silent expression of nature's vigilance. Again, we see one horse becomes affected with laminitis without his feet having been subjected to much if any stress or exertion, whilst another horse is worked most unmercifully, and his feet neglected in every imaginable way, without laminitis supervening. How is this? It is simply attributable to the difference of constitutional tendency and condition of the bones. I would here remark, it is generally speaking the low stepper, the shuffling goer, that is the victim to laminitis. I feel convinced in my own mind, that this disease dates its real commencement (in most if not in all cases) long antecedent to the time usually ascribed to it; and I am satisfied, from extensive *post-mortem* investigations, that we frequently have cases that would be called by all experienced and practical men, laminitis, where the laminal tissues are not, nor have been at any antecedent date, actively inflamed, but where the internal structure of the coffin-bone has for some time been undergoing a change. "Mollities," you may possibly advance, as an argument to strengthen your view, the fact of the augmented thickness of bone from the commencement of active disease, but this, to my mind, is not conclusive evidence; it may demonstrate by contrast a previous unnatural thin attenuated growth of bone.

#### NAVICULAR DISEASE.

The opinion I entertain upon the subject of navicular disease is, that in by far the greater majority (if not all) of these cases there exists in the animal affected a congenital tendency or predisposition, that, generally speaking, it is the high stepper, the good goer, that becomes the victim to this disease; and it is a fact well attested, that it as frequently develops itself in the feet with wide frogs, bulbous heels, shallow heels, spread flattish feet, - as in the narrow upright feet; and that contraction, so far from it being a necessary indication of this disease, follows almost certain upon any lameness, wherever situated, that necessitates an absence of natural pressure and weight being thrown down into the heels of the foot; this is clearly proved, for after neurotomy, the pain being removed, and the weight being again thrown into the heels, they expand, notwithstanding that the disease is still going on in the foot. I am satisfied, from numerous *post-mortem* examinations, that there are numbers of cases of lameness that would be pronounced to be chronic navicular disease by all practical men, but in which neither the navicular ligaments, nor true navicular joint (the foot-joint capsule), are

diseased, nor have they been at any antecedent period actively inflamed; but where the internal structure of the navicular bone has been absorbed and become hollow, the change that has been going on is "Fragilitas," a state differing very greatly from *Mollities*, since we nearly always find a great proneness to the formation of exostosis, spavins, and splents, &c. &c., in the animals of this special tendency. I have known foals, born from defective parents, in whom this condition was so strongly developed, that all men would at once pronounce them affected with navicular disease, and such lamenesses were permanent. I am persuaded that the structures of the bones are in a defective state, and that, if their true condition could be fully ascertained, they would, to all intents and purposes, be pronounced unsound, and this, too, probably many weeks, or even months, previous to lameness having shown itself. It has been observed he has been guilty of dropping occasionally some time before. Is it not notorious that a horse will show lame for the first time the day after, or the day but one after, he has been newly shod, he having been standing idling some time previously, though no fault can be in any way attached to the shoeing? Is it not equally notorious, that a horse will show lame for the first time the day after, or day but one after, he has been ramped about in a fair? I would here remark, that it is quite possible that a slight lameness may exist at the time (and even before going to the fair), and the breeder or dealer be quite unconscious of its existence, since they are neither of them professional men, or perhaps expert in detecting lameness. They may not have had him run out upon the hard pavement to test him. Such a thought as his being lame never once occurred to their minds, therefore no necessity requiring it. Now, what other inference is deducible but the one I am contending for—namely, that the part had sustained or acquired a morbid condition, and had become susceptible to yield, and having yielded, pain is the result, troublesome, obstinate tenderness, and too often, alas, permanent lameness? The veterinary surgeon, on his first visit, being told the horse has never been lame before, does not feel justified in pronouncing definitely upon it, the lameness has no precise or clear symptoms, nothing, apparently, to account for it; but, after bleeding, purging, poulticing, &c. &c., he finds the lameness continue quite stationary. Had it been simple, and wholly recent, it is quite reasonable to conclude it would have subsided with such treatment. The practitioner may have had some misgivings in his own mind, which are now confirmed, and proved to be facts. He now speaks out, and calls it "Chronic Navicular Disease," for lo and behold the other foot is also showing suspicious symptoms of coming lameness. If he is a man of a candid and enlightened mind, it is not incompatible with common sense, honesty, and experience, for him to say, "these parts must of necessity have been for some time pre-



viously getting into a state of disease, but that such disease was in an obscure latent state, not sufficient to produce lameness, and it has now, from one of the above stated causes, or some other existing circumstances, assumed a more active form ;” and in the majority of these kinds of cases the practitioner comes out of the contest more in the character of the vanquished than the victor.—Yours most truly,

THOMAS GREAVES.

---

## MEETINGS OF SOCIETIES.

---

### THE LANCASHIRE VETERINARY MEDICAL ASSOCIATION.

THE members of the above Association held their eighth meeting at the Brunswick Hotel, Piccadilly, Manchester, on the evening of the 14th instant, the President in the chair. The following veterinary surgeons were present:—Thomas Greaves, Esq., Manchester; John Lawson, Esq., do.; Cuthbert Simpson, Esq., do.; Peter Taylor, Esq., do.; Peter Taylor, jun., Esq., do.; Roger Hampson, Esq., do.; W. Haycock, Esq., do.; G. Seranous, Esq., do.; W. Dixon, Esq., do.; James Haslem, Esq., do.; Nicholas Carney, Esq., do.; E. Boyle, Esq., do.; C. M. Rawlings, Esq., do.; R. L. E. Hunt, Esq. Birmingham, President of the Royal College of Veterinary Surgeons; E. C. Dray, Esq., Leeds, President of the Yorkshire Veterinary Medical Society; James Broad, Esq., Bath; W. Cartright, Esq., Whitchurch; John Greaves, Esq., Altrincham; James Brookes, Esq., Pilkington; James Howel, Esq., Rochdale; James Taylor, Esq., Oldham; Roger Bridge, Esq., Bury; G. Brown, Esq., Oldham; T. M. Leach, Esq., Bakewell; Wm. Whittle, Esq., Worsley; John Smith, Esq., Ormskirk; G. Morgan, Esq., Liverpool; John Simpson, Esq., do.; J. Brydon, Esq., do.; William Williams, Esq., Bradford, Secretary to the Yorkshire Society; J. H. Carter, Esq., Bradford; Wm. Toll, Esq., Lichfield; Wm. Litt, Esq., Shrewsbury; — Lee, Esq., Macclesfield; — M'Taggart, Esq., Halifax; G. Fleming, Esq., F.R.G.S., F.A.S.L. and V.S., King's Own Hussars; Walker Taylor, Esq., Stockport; and others.

A most excellent paper was read by Mr Lawson, of Manchester, upon Tetanus in the Horse, which was followed by a lengthy and most interesting discussion. Mr Howel, of Rochdale, kindly volunteered to bring in a paper upon puerpural fever in the cow at our next meeting.

R. HAMPSON, *President.*

J. TAYLOR, *Hon. Sec.*

---

## PERISCOPE.

---

WEED.

(From the *Scottish Farmer and Horticulturist*, September 7, 1864.)

THIS is one of the most common diseases to which agricultural horses are liable. It is known in different parts of the country by various designations—such as water-farcy, shot of grease, thick-leg, Monday-morning disease, &c. From the fact that the absorbent or lymphatic vessels are the parts chiefly implicated in the disease, it has been called Angeiroleucitis—or, more properly, Lymphatitis—by veterinarians. The term weed is popularly applied in Scot-

land to any disease, whether in man or animals, which is ushered in by a violent shivering of short duration, and followed by an inflammatory swelling of some one part of the body. Thus it is that in woman the name is associated with the idea of painful swelling of the breast or face, in the cow with inflammation of the udder, and in the horse with inflammation of the lymphatics.

The first symptom is the rigour or shivering, which is of a very violent character, but often of so short duration that, occurring as it frequently does during the night, it is liable to escape notice altogether. When the shivering has set in, the other symptoms of fever are also present in an equally marked degree. There is great restlessness, loss of appetite, costiveness, hanging head, reddened eyes, and increased rapidity of the pulse, which usually numbers from seventy to over one hundred per minute. The shivering stage soon gives place to the hot one; and with more marked injection of the mucous membranes of the eyes and nostrils, abundant perspirations break out over the whole body, and at the same time the patient is observed to rest constantly on one of its legs, generally a hind one. On examination, this leg is found to be swollen high up on the inside of the thigh, and close to the udder or sheath. The swelling rapidly extends downward along the course of the superficial veins inside the limb; and in an incredibly short time the whole extremity has become rounded and thickened, especially below the hock, where the absence of all soft and bulky tissues renders the change the more apparent. The limb is extremely painful and tender, especially high up in the groin and along the course of the vessels; so much so that, when these parts are pressed or manipulated, the patient lifts up the leg, at the same time turning it outward, and is ready to lose his equilibrium. The character of the swelling varies at different points—thus, high up in the groin is a hard nodulated mass formed by the inflamed inguinal glands; below this, along the course of the veins, there is the sensation of hard knotty cords; and below the hock the whole leg feels more or less puffy or doughy, retaining for some time the impression of the finger. These characters depend on the nature of the structures involved. The lymphatics are a set of vessels quite distinct from the blood-vessels, though usually running in company with the veins, and the function of which is to take up from all parts of the body the lymph or nutritive material that has passed through the attenuated coats of the small capillary blood-vessels for the purposes of nutrition, but which has not been used up so as to become effete matter, or to have its tissue-forming powers destroyed. These vessels, coming from all parts of the body, converge to two large trunks, through which their contents are poured into the venous system. On their course are numerous groups of glands, apparently destined to the elaboration of the lymph, in order that it may assist in blood formation. The lymphatic vessels are abundantly supplied with valves—much more so, indeed, than the veins—and these open in an upward direction, so as to prevent any reflux of fluid whilst it permits it to pass uninterruptedly towards the larger trunks. As the vessel is constricted opposite each of these valves, and enlarged above it, the frequency of these structures gives to the trunk a peculiar beaded appearance. It is this peculiarity that gives rise to the knotty feeling of the vessels when their coats become thickened and indurated by inflammation. The lymphatics of the hind extremity, and especially those of the skin, are much more numerous distributed on the inner side of the limb than on the outer, and the larger trunks follow the same course as the superficial veins, which will account for the enlargement being most marked on the inner side. The superficial inguinal glands, situated high up in the groin, immediately beneath the integument, and which form the bulk of the swelling in this region, consist of about a dozen principal lobules or glands, and several smaller ones. They extend along the course of the large vessels for from two to three inches; and, though scarcely perceptible in health, form a large indurated and nodular mass in cases of weed.

In the course of one or two hours after the inflammation of the lymphatic vessels and glands has set in, the parts in the vicinity of these tissues become



infiltrated with serum, the leg becomes rounded, soft, and yielding to pressure, retaining the imprint of the finger, and appearing less tender than before. It is in this rounded condition that the leg is usually first seen in the morning, the primary stage having passed over, and the limb, to use a common phrase, having become as thick as a post. The swelling in the groin, if well marked, usually embraces the sheath in the horse, and the udder in the mare, from the implications of their numerous lymphatics and the exudation of serum. When the engorgement of the limb continues for some time, it is not unfrequent to find swellings taking place in the vicinity of the joints, which soften and burst, leaving large unhealthy sores, discharging large quantities of a glairy fluid.

The action which attends the earlier stage of the disease is usually greatly moderated as soon as a free exudation has taken place; and accordingly, after one or two days, though there may be still a considerable engorgement of the limb, there is often comparatively little constitutional disturbance.

Weed is not a fatal disorder. In mild cases, and especially if early subjected to active treatment, the limb is commonly restored to its natural condition, and nothing is left to point out the limb that has been diseased. In severer cases, especially if neglected or badly treated at first, and almost invariably, if the limb has been the subject of several attacks, a thickening is left, more or less marked according as the affection has been severe or often repeated. In some long-standing cases the limb becomes an unwieldy and unsightly mass, sometimes having a circumference of 3 feet about the fetlock. This permanent enlargement of the limb is what is chiefly to be feared in this disease; and although it may not follow the first or second attack, still a horse once the subject of weed becomes increasingly liable to subsequent attacks; and as the parts involved, become by a succession of onsets, gradually less able to react and reassume their healthy condition, this is pretty certain to be the ultimate result.

The lymphatics may be inflamed from other causes. Thus, when matter is being formed within the hoof, these vessels become engorged as far up as the hock or knee—the swelling occurring on each side of the back tendons. Again, if a poisoned wound exists in any part, the lymphatics leading from it are traceable as inflamed and knotted cords. But in each of these cases the swelling extends from below upwards, and the glands in the higher parts of the limbs are not the parts primarily affected. The great heat and tenderness in the foot, in the one case, and the presence of the unhealthy sore, in the other, will also serve as ready means of distinction. To the swelled legs and corded feeling of the vessels in farcy the same remark applies, that the enlargement commences below, and gradually advances up the limb. This, with the slow progress of the disease, and the absence of the active fever, suffices to distinguish it at once.

In horses dying from weed, or killed during its active stage, the lymphatic vessels of the affected limb are reddened and inflamed, their walls being greatly increased in thickness, and the blood-vessels that nourish them enlarged and injected. The glands are similarly enlarged and inflamed, and around both vessels and glands the cellular tissue is infiltrated with a yellowish serum. This inflammation of the lymphatics is traceable upwards into the abdomen, and extensive exudations of serum are often found around the lymphatic glands of the loins. The blood is such as is met with in all cases of active fever, there being a greater tendency to the aggregation of the red globules into masses, and to the formation of a large quantity of colourless clot, commonly called the buffy coat. In cases of chronic enlargement of a limb consequent on weed, the whole enlarged extremity is infiltrated with a pale, straw-coloured serum, which flows out on incisions being made, and the lymphatic vessels, increased in size often to double the diameter of a goose quill, are found buried in this infiltrated mass on each side of the back tendons.

Weed has been not inaptly termed the Monday-morning Disease, from the fact that it usually occurs after the Sunday's rest, though it is quite as frequent after a wet day, during which heavily fed and hard-worked horses have been doomed to imprisonment in the stable. It will sometimes supervene on an over-



feed of oats, and at times occurs after a change of food to good clover or vetches. In all cases, however, it is associated with high feeding, with the elaboration of large quantities of highly stimulating and nutritive blood, and with a deficiency of exercise. The animal system rapidly accommodates itself to the conditions in which it is placed. Hence the *embonpoint* so characteristic of pregnancy; hence the rapid formation of fatty materials in animals denied exercise and subjected to high feeding; and hence, too, the abundant production of nitrogenous or flesh-forming materials in those that are at once highly fed and sufficiently exercised. The system, moreover, acquires in this way certain habitudes which it cannot at once throw off, and hence the occasional evil effects of any sudden and violent change in food or regimen. In the case of hard-working horses, which are rapidly forming large quantities of highly nutritive blood, a day's idleness with a continuance of high feeding leads to the accumulation in the system of a large quantity of nutritive materials for which there is no demand, as there is little waste and as little need of repair in the locomotive organs. This overloading of the vascular system, consequent on the want of balance in the supply and consumption, leads to over excitement and inflammation of some portion of this apparatus, and in the case before us the glands are the first to suffer. Once these have become congested and impermeable, the lymphatics below them are no longer able to discharge their contents; and, accordingly, their gorged condition, and the sympathy existing between them and the glands, lead to a rapid extension of the inflammation along the trunks in a downward direction.

No class of horse is absolutely exempt from weed, though it is far more frequent in sluggish, lymphatic, thick-legged horses than in those of an opposite conformation. Gross feeding animals, too, are especially liable; and some such, when standing idle, will, if supplied, devour a far greater quantity of fodder than when kept at regular work. Any local weakness will often determine the disease to a particular limb. Like some other affections, it often appears to select a white leg for its attack, while any previous sprain or other injury that may have permanently weakened an extremity will almost invariably ensure that that will be the one to suffer.

In treating such a disease, it is rational to seek first to remove the condition of the system on which the malady depends, and for this purpose no treatment is more effectual than early and free blood-letting. In the early part of the shivering stage, and before any local tenderness is observed, the malady may sometimes be checked by warm drinks and clysters, hand-rubbing, and comfortable clothing, followed by exercise and purgation; but when the limb is much inflamed, no measure can be adopted more likely to benefit the patient than the use of the lancet. Of cases treated side by side, with and without bleeding, those that were bled were observed to make the most rapid and perfect recoveries, although the others were treated as actively in other respects. As a rule, from four to five quarts of blood should be abstracted, though its flow should only be checked when the pulse is felt to beat softer. Blood is best drawn from the jugular, as any wound of the limb is liable to prove troublesome, while it is of no special immediate advantage. From six to eight drachms of aloes should then be given in ball, and its action may be encouraged by giving warm-water clysters every two hours. The patient should be comfortably clothed; and unless he is absolutely unable to move, he should be walked out in a sheltered place three or four times daily for an hour at a time. In horses subject to weeds, an attack may often be warded off by taking the animal out and giving him a sufficiency of light work or exercise. Such horses will often be quite well on the following day, especially if a laxative has at the same time been given. In any case, the patient should have the entire affected limb fomented with warm water several times a-day, and the application should be kept up for two hours at a time. When suspended, the limb must be carefully dried, and the animal secured from cold draughts. During the action of the physic, no exercise can be given; but as soon as it has set, it should be again commenced,



and gradually increased as the animal can bear it. After the setting of the physic, ounce-doses of nitre may be beneficially given in a bran mash daily; and when the heat and tenderness of the limb have subsided, a flannel bandage, firmly and equally applied from the hoof upward, is excellently adapted to support the infiltrated limb, and to encourage absorption of the effused material. In some bad cases, the limb may be scarified with advantage, though, if well treated in the earlier stages, this will seldom be needed. When enlargement of the inguinal glands remains after the other symptoms have disappeared, the daily application of iodine ointment will usually cause its speedy dispersion. The diet throughout the whole course of the disease should consist of mashes, roots, grass in small quantity, and other non-stimulating agents, though the weakness resulting from the disease may ultimately require to be combated by tonics and nourishing diet, combined with moderate and regular exercise.

The most simple prophylactic measures regularly adhered to would reduce this disease to a tithe of its present prevalence in certain districts. It will be inferred from what is stated above that the lymphatic horse with coarse and hairy legs is especially objectionable, as being particularly obnoxious to weed. Like other affections connected with a special constitution, this is hereditary; hence the progeny of horses of this kind is similarly to be disapproved of. Regular feeding and exercise will almost certainly prevent weed; but as farm horses are necessarily idle on Sundays, they should be allowed two hours' walking exercise daily in the morning and evening, especially at such times as they are subjected to hard work and high feeding. This will be found much more advantageous than any reduction in the allowance for that day, as is too often adopted. On wet days, and others on which the horses are thrown idle, the same precaution should be employed. Some are in the habit of giving their horses a bran-mash on Saturday nights containing an ounce of nitre, and the practice has been found highly beneficial in warding off weeds and other affections.

---

## COMPARATIVE VALUE OF THE DIFFERENT GRASSES.

By ARCHIBALD STURROCK, Kilnarnock.

(Continued from p. 576.)

---

(From the Journal of Agriculture, July 1864.)

---

### WOOD MEADOW-GRASS.

(*Poa nemoralis*, of the tribe *Poaceæ*.)

PANICLE spreading, and slightly drooping to one side; florets webbed or downy—*i. e.*, hairy at their base; outer pale of floret five-ribbed; the uppermost sheath usually not so long—never longer than its leaf—and crowned with a very short obtuse ligule, or even merely the semblance of a ligule.

This species is not a frequent grass throughout Scotland, although common in certain localities, and, as its name implies, is found in its natural state only in shady places or woods of rich soil. The root is perennial, fibrous, but *slightly creeping*, particularly if growing in light soil; the culms are erect and slender, and grow from 18 inches to 2 feet high; and the whole plant is of a light green colour. The *P. nemoralis* ranks amongst the superior *permanent pasture* grasses, producing a considerable quantity of fine, succulent, and nutritive herbage, which cattle of all kinds are remarkably fond of. It is in an especial manner well adapted for sowing down pleasure-grounds and other places where the *land is much shaded by trees*, thriving not only well in such situations, but forming a close sward where few of the other fine grasses can exist; nevertheless, it prospers also well enough when grown in open exposed situations, and

even so although the soil may be rather light and inferior. It is rather a slow grower, particularly in the after-grass, but has a very regular, close habit of growth, choking and killing annual weeds in a marked manner better than most other grasses. This species blooms about the third week in June, and ripens its seeds towards the end of July. The average price of its seeds is about 1s. per pound, or rather less.

A frequent variety of the above—the *P. nemoralis*, var. *angustifolia*—has the panicle more erect, the leaves longer and narrower, the top joint of the stem *near to* the panicle, and the *spikelets* of only *two florets*.

#### FLOATING GLYCERIA, OR FLOATING SWEET MEADOW-GRASS.

(*Glyceria fluitans*, now usually called *Poa fluitans*, of the tribe *Poaceæ*.)

Panicle very long and slender, sometimes only slightly branched at the base, but usually branched till near the very end; spikelets long and linear, of seven to ten florets, the florets variegated at the summit with a streak of silvery white; florets not webbed; outer pale of floret seven-ribbed.

This aquatic species grows wild on almost all alluvial marshes and wet meadows, and is very common in and by the sides of ditches of running water. Its root is perennial and creeping. The stems are much sheathed—the sheaths overlapping one another—and both stems and sheaths are of a flattish-oval shape; the leaves being broad and very long, and of a dull green. The stem is decumbent near the root, oblique in the middle; the foliage floating on the surface of the water when that is present, and nearly erect in the upper part. The herbage of this grass is very *rich in saccharine* matter; and it is much sought after and eaten with avidity by cows. Being fond of an abundant supply of water, it is admirably adapted for all *regularly irrigated* meadows, and will yield also a considerable produce on pasture on common *wet* soils. Its seeds are much eaten by birds, and are very nutritious. In some parts of the Continent they are occasionally ground into flour in seasons of scarcity, and make bread little inferior to that made from wheat. This species flowers from the end of June and onwards, ripens its seeds irregularly, and they are easily shaken off when ripe from the beginning till middle of August; and the seeds rate at about 1s. per pound, sometimes less. The *varieties* of the spiked or slender fescue bear occasionally a resemblance to the *Poa fluitans*.

Another water species, formerly included in the now extinct genus *Glyceria*, is the *Poa aquatica*—reed or water sweet meadow-grass. This reedy species grows to great size, with large foliage and powerfully-creeping roots; but from its habits it is of little or no use for common farming hay purposes.

#### SWEET-SCENTED VERNAL OR SPRING GRASS.

(*Anthoxanthum odoratum*, of the tribe *Anthoxanthaceæ*.)

Inflorescence simple paniced; panicle close, appearing as if spiked, erect, about an inch and a-half more or less in length, and of a long ovate form; spikelets about four or five together upon very short branches of one floret each; floret of two paleæ of equal size, of a brownish colour, and hairy, and both furnished with awns of unequal lengths; root fibrous, and very perennial.

The genus *Anthoxanthum* forms a tribe by itself.

This is the *earliest* of all the grasses, and is also one of the most enduring or *strictly permanent*. The culms on good pasture-land grow to about 9 inches or a foot in length; but on deep, rich, moist soils, where only this grass reaches perfection, they attain a height of 18 inches or more. It produces comparatively only a *small* bulk of herbage; the root-leaves being of medium length, flat, and acute, of a light green colour, and more or less hairy on both surfaces. Its culms are of little value, as they are seldom eaten, and even its root-leaves, although eaten in pasture along with other herbage, especially by sheep, seem to be by no means so much relished as those of the majority of pasture-grasses;



still, as it is one of those few grasses which abound in *bitter extractive*, and also on account of its *very early* growth, it ought always to occupy the place of a *minor* ingredient in any mixture intended for *permanent* pasture. The after-grass of this species, unlike most of the superior pasture-grasses, is found to contain more nourishment than the first cut or flowering-crop. The *A. odoratum* is the only species native to Britain. It blooms from the middle of May, and ripens its seeds from middle till end of June. It is most abundant in nutritive matter when the seeds are ripe. The seeds, which generally have the brown hairy pales adhering to them, range in different seasons from 1s. 6d. to 2s. per pound.

One or two foreign species of this unogenerical plant have been introduced, but they are not of any agricultural value.

#### YELLOW OR GOLDEN OAT-GRASS.

(*Trisetum flavescens*, of the tribe *Avenaceæ*.)

Still more generally known and sold under the name *Avena flavescens*. Panicle erect, spreading, much branched—the lower branches arising from the rachis mostly in fives, and of a yellowish green, changing to a beautiful golden yellow when ripe; spikelets small and numerous, usually of three-awned florets, the outer pale of floret tinged with light green, bifid; awn longer than the pale, and becoming bent or angle-shaped when dry; leaves and sheaths hairy; ligule very short and obtuse.

This species is one of the most useful of the formerly large genus *Avena*, and is noted from all the other native species by the smallness of its seeds. The root is perennial, fibrous, but having a very slightly creeping habit; and the culms, which are smooth and polished, grow to a height of 1 to 2 feet. It yields a considerable produce of *fine herbage*, if growing in mixture with other grasses. It is naturally of high altitude, and is found to thrive best on dry and especially calcareous soils. It contains in its nutritive elements a large proportion of *bitter extract*, and can be recommended as a *minor* ingredient in the herbage of all pasture-land, especially if the land be of high elevation, and the herbage to be grazed chiefly by sheep. It comes into flower about the beginning of July, ripens its seeds from the beginning till the middle of August, and contains rather more nutritive matter if taken when in flower than it does when the seeds are ripe. *Genuine unmixed* seeds of the golden oat-grass cannot usually be had under 2s. per lb. The seeds of *Aira flexuosa*, noticed further on, much resemble those of *Trisetum flavescens*, and the former may be, and possibly are, sometimes substituted and sold as the latter. Other two species of the genus *Trisetum*, the *T. pratense* (meadow oat-grass), and *T. pubescens* (downy oat-grass), have very little agricultural value. They are known from *T. flavescens* by their *spikelets* being *fewer* and much *larger*, and the *ligule* being *long* and *pointed*. They are found most frequently growing on rocky ground and dry heaths, occasionally also in meadows, but giving a preference always to calcareous soils.

The genus *Avena*, or oatlike grasses, formerly included a vast number of species, both native and foreign, most of which are now assigned by modern botanists to other genera. The only two native species now left in the family are the *A. strigosa*—British pointed oat (called also *Danthonia strigosa*), and the *A. fatua*—wild oat; both of these very much resemble each other, as well as the common cultivated oat (*A. sativa*), and are troublesome weeds to the farmer. The outer pale of the floret in *A. fatua* is *very hairy*, with *four* ribs on each side, and the *florets* are *much shorter* than the *glumes*; whilst in *A. strigosa* the florets are as long as the glumes, and the panicle inclines to one side.

The genus *Aira*, or hair-grasses, also ranges under the tribe *Avenaceæ*. Modern botanists have likewise much reduced this family in numbers; it comprising now only six native species, which are all more or less of little value in an agricultural sense, and some of them only worthless annual or injurious



weeds. The *A. cæspitosa*—tufted hair-grass, star-grass, or hussock-grass—is the most common, and has a most unsightly appearance in pastures, growing in large tufts or “hussocks.” It *prefers* soils of a *moist clayey* nature, and is frequent in some parts, growing in the ridge-furrows of undrained or wet-pasture-fields. Its herbage is *very harsh*, and never eaten by cattle except when they are forced to it through want. It is only serviceable as a cover for game—*vermin* on only too many farms; and the sooner *A. cæspitosa* is rooted out of a farm the better. A variety of this species, *A. cæspitosa lutescens* (yellowish hair-grass), was introduced from the Low Countries by Mr Lawson of Edinburgh some years ago. It is much earlier and of *dwarfer* growth, has less tendency to form tufts, and its herbage is also more tender and agreeable to cattle. The seeds of this variety can now be had for about 9d. per pound.

The *A. flexuosa* (wavy mountain hair-grass) is plentiful on some of our Scotch hills, producing a little herbage, which is eaten by sheep; but it cannot be much recommended for cultivation, except, perhaps, in small proportions for *moorish soils*. Its seeds can be had from 6d. per pound.

---

## THE INSPECTION OF MARKETS.

(From the *Scottish Farmer and Horticulturist*, September 7, 1864.)

WE have been requested to publish the following letter, addressed by members of the medical profession in this city to the Lord Provost. We understand that Dr Burt, President of the Royal College of Physicians, had addressed a special letter on the subject to his Lordship:—

TO THE RIGHT HONOURABLE THE LORD PROVOST OF THE CITY OF EDINBURGH.

Edinburgh, September 2, 1864.

MY LORD—By a remit of the Edinburgh Town Council, it has devolved on the Market Committee to recommend for appointment persons to act respectively as Superintendent and Assistant-Superintendents of Slaughter-Houses and Inspector of Markets. It was with much pleasure that we noticed the determination on the part of the Town Council to appoint, at liberal salaries, gentlemen having a knowledge of the diseases of cattle; and, in fact, having by education fitted themselves for the very difficult duty of recognising diseased conditions in animals both before and after death.

There are undoubtedly those who believe that butchers and cattle-dealers are the most likely persons to possess the knowledge required for the above-mentioned offices, and that a moderate amount of professional knowledge in certain candidates for subordinate offices is all that is required to secure a proper inspection of live stock and dead meat in this city.

As the question of supplying wholesome food to the people is one which we regard as of grave importance, we wish to draw your Lordship's attention to the following facts:—

*First*,—Of late years plagues have been rife amongst animals, which it is believed affect to no small extent the health of the people, from the number of diseased carcasses they render available as human food. The necessity of a careful investigation of these plagues by competent professional inspectors is much felt, so as to enable medical men to trace the connection between them and the constant development of new forms of disease in man.

*Secondly*,—Insidious, dangerous, and even fatal parasitic diseases have been discovered of late as common to men and animals. Such maladies require scientific knowledge and skill in microscopic manipulation to secure their recognition. Inspectors should possess these qualifications.

Whilst congratulating the Council on the interest it has recently manifested in this important question, we desire, before it be too late, to draw your Lordship's attention to the views generally entertained by the medical profession,



to the effect that duly qualified veterinary surgeons should be appointed to such offices as those now vacant in this city.

Fully persuaded that your Lordship will study the best interests of the public in this matter, we beg to subscribe ourselves your Lordship's very obedient servants,

BENJAMIN BELL, President of the Royal College of Surgeons, Edin.

J. BEGBIE, M.D., Charlotte Square.

DOUGLAS MACLAGAN, Professor of Medical Jurisprudence.

J. Y. SIMPSON, M.D., Professor of Midwifery.

GEORGE W. BALFOUR, M.D.

JOHN BROWN, M.D.

ALEX. WOOD, M.D.

WILLIAM CUMMING, M.D.

R. P. RITCHIE, M.D.

PATRICK HERON WATSON.

JOHN MOIR, M.D.

J. WARBURTON BEGBIE, M.D.

JAMES A. HUNTER, M.D.

JOHN YOUNG MYRTLE, M.D., F.R.C.P.

WILLIAM R. SANDERS, M.D., F.R.C.P.

D. ARGYLL ROBERTSON, M.D., F.R.C.S.

CRAIG MACLAGAN, M.D.

JAMES SPENCE, F.R.C.S.E.

JAMES DUNSMURE, M.D., F.R.C.S.E.

THOMAS GRAHAM WEIR, M.D., F.R.C.P.E.

J. S. COMBE, M.D., F.R.S.E.

WM. DUMBRECK, M.D., F.R.C.S.

W. MENZIES, M.D., F.R.C.S.E.

T. STRETHILL WRIGHT, M.D., F.R.C.P.

ADAM HUNTER, M.D.

HENRY D. LITTLEJOHN, M.D., Medical Officer of Health.

This letter was before the Council yesterday, and was referred to in the discussion which took place on the report of the committee recommending the appointment of the following gentlemen:—1. Inspector of Markets—Mr Robert Wilson, cattle-agent and farmer, Halliday Hill, Dalton, Lockerbie. 2. Assistant-Inspector of Markets—Mr Thomas Dickson, the present inspector. 3. Superintendent of Slaughter-Houses, Mr David Anderson, formerly butcher and cattle salesman, and latterly farmer, Lyne, by Peebles. 4. Assistant Superintendent of Slaughter-Houses—Mr Robert Reid, veterinary surgeon, Shires Mill, Culross.

The report of the committee was finally agreed to.

## MEMORANDUM ON A SCHEME FOR THE INVESTIGATION OF EPIDEMIC AND EPIZOOTIC DISEASES,

DRAWN UP AT THE REQUEST OF A COMMITTEE APPOINTED FOR THAT OBJECT AT  
THE ANNUAL MEETING OF THE BRITISH MEDICAL ASSOCIATION IN AUGUST, 1862.  
By W. BUDD, M.D., Clifton.

*(From the Medical Times and Gazette, August 20, 1864.)*

Dr Budd proposed an investigation of the following questions:—

“1. The nature of the evidence showing the disease that may be the subject of inquiry to be contagious or communicable.

“2. Whether such disease admits of being artificially propagated by inoculation or otherwise; and if by inoculation, what are the morbid products which are capable of conveying the virus?

“3. Through what surface or surfaces the virus may be shown to enter the body and to leave it.

“ 4. Whether the disease is distinguished by eruptions, external or internal, or by ejecta more or less characteristic ?

“ 5. At what periods of the disease, if ascertainable, the power to propagate by contagion begins and ceases ?

“ 6. Through what media the specific poison passes from the infected to the non-infected ; whether it be transmissible by fomites, by mediate intercourse, or is carried by flies or birds.<sup>1</sup>

“ 7. Whether the poison is cast off in a form in which a considerable portion of it is likely to pass into the dried state, and if so, whether there are any facts tending to show how long, when in this state, it may retain its noxious powers ?

“ 8. Whether the individual disease under inquiry has a period of true incubation, and if so, what are its length and limits ?

“ 9. Whether one attack, as in smallpox and many others, preserves against future attacks ?

“ 10. Whether, in the case of human disease, animals as well as man are susceptible, and if so, what animals ; or in the case of animal diseases, whether more than one species, and if so, what species ?

“ 11. What the evidence, if any, as to the particular country or region in which the disease first appeared ?

“ 12. What its present geographical limits ?

“ 13. Whether there is any evidence, and if so, what evidence, of its modern or recent introduction into and establishment in countries previously exempt ?

“ 14. How far any such disease may have been prevented from invading new countries, or from spreading from any particular centre, by measures directed against contagion ?

“ 15. Whether it is capable of assuming different types, so as to cause maladies which, although diverse in outward guise, are only the same disease in different forms ?

“ 16. What the evidence *supposed* to show that the specific poison of a contagious disease may originate spontaneously or be generated *de novo* ?

“ 17. And lastly, as of secondary and minor importance, data tending to show in what manner the action of each specific poison is affected by conditions relating (a) to the individual, such, for instance, as age, sex, state of health, &c. &c. ; (b) by conditions, relating to the poison, such as greater or less malignity of the case from which derived, greater or less concentration, &c. &c. ; and (c) by conditions independent of the individual and of the poison, but acting on both, such as climate, weather, soil, drought, and rainfall, &c. &c.”

In the determination of conditions of this order statistics find their true province. What we most want to know in regard to this whole group of diseases is, where and how the specific poisons which are their cause breed and multiply. In smallpox we have ocular proof that the poison breeds in the living body, and it may be assumed as certain that the same is the case with the other diseases of this family which agree with smallpox in certain leading characteristics. This being so, the question arises—granting that these poisons do breed in the living body—whether they may not also be generated elsewhere ?

Questions 8, 9, 10, 11, 13, 14, and, in a less degree, number 12 also, are clearly of the greatest significance in their bearing on the answer to be given to this question.

Some parts of the general inquiry might advantageously be made the subject of a separate and independent report. Such is especially the case, for instance, with the question just referred to, as to whether, namely, the poisons of specific contagious diseases ever originate spontaneously.

“ After giving many years of time and thought to an examination of the evidence bearing on this question, I have,” said Dr Budd, “ myself come to the conclusion that there is no proof whatever that they ever do so. That the evi-

<sup>1</sup> In the recent epidemic of variola ovina in Wilts, *starlings* are supposed by Professor Simmonds to have had a principal hand in propagating the disorder.



dence, in fact, on which the contrary conclusion is founded is negative only; that evidence of precisely the same order—only to all appearance still more cogent—would prove animals and plants, even of large species, to originate spontaneously; that this evidence is, therefore, of no weight; and lastly, that, as in the case of plants and animals, all the really important facts point the other way, and tend to prove that these poisons, to use a word that is probably provisional only, like animals and plants, however they may have once originated, are only propagated now by the law of continuous succession. Opinions like these are no doubt at present those of a small minority.

“A very large, and by far the most influential, school in this country,—a school which probably embraces the great majority of medical practitioners, and the whole of the ‘sanitary’ public—holds the exact contrary, and teaches that sundry of these poisons are constantly being generated *de novo* by the material conditions which surround us.

“In regard to the great work of prevention, it is obviously of the first importance to determine with which of these two parties the truth really lies; for so long as opinion remains divided as to this cardinal point, it is vain to hope for the general adoption of any definite scheme of preventive measures. A report on this subject by a really competent hand might do much towards settling public opinion in regard to it.

“Certain other points would admit of being studied experimentally. I would cite, as an example, the influence of heat on contagious poisons. Rather more than twenty years ago the late Dr Henry showed, by a series of decisive experiments, that the powers of the smallpox poison are destroyed by a temperature of 212° Fahr. These experiments have since been repeated and extended by a committee at York, who have published a very valuable report on the subject.

“As regards the whole subject of the investigation of contagious epidemics, perhaps the best course would be not to deal with it collectively, but to report at first, in reference to the several heads enumerated above, and any others that might appear important, on one or two typical members of the class.

“If I might venture to make a suggestion, it would be that the following diseases should be thus dealt with in the first instance:—

- “1. Typhoid or intestinal fever.
- “2. Maculated typhus.
- “3. The rinderpest, or cattle-plague.
- “4. The foot-and-mouth diseases of oxen and other animals.
- “5. The pleuro-pneumonia of cattle.
- “6. The variola ovina, or smallpox of sheep.

“It is not without design that in this list the epizootics are made to outnumber the diseases of man. The reason is, that, in regard to everything which concerns the genesis and reproduction of specific contagions, it is much easier to obtain sure and precise data in the case of animals than in that of man.

“In a paper on malignant pustule which I read at our last annual meeting (1862), I pointed out some of the many advantages which these diseases offer to the inquirer, and from which we are, for the most part, often debarred in our own case.

“These advantages are illustrated in a very striking way by the list of epizootics just suggested.

“Not the least among them is the fact that three out of four of these epizootics—if not all four—admit of being propagated by contagion,—of being, therefore, studied experimentally.

“Two of them, the rinderpest and the variola ovina, have an interest of another kind, which is of the highest possible importance in relation to the general inquiry.

“The morbid changes which are characteristic of the cattle-plague bear in every respect so close a resemblance to those of intestinal fever in man—and the eruption of the variola ovina is in its appearance and distribution so close a

counterpart to that of smallpox—that many observers of the first animal have been led in either case to consider the human disease and the animal disease to be identical.

“And yet, as far as present evidence goes, it appears, not only that this is not so, but that both these diseases present the remarkable and deeply significant characteristic—a characteristic which is observed, indeed, in many other members of the same family—of being absolutely peculiar to the species of animal in which they severally occur.

“Both also—agreeing in this with smallpox and with contagious fevers generally—are diseases which happen only once in life.

“So that the poison of the *variola ovina*, for instance, not only is incapable of breeding in the body of any other animal, but cannot even breed in the body of the sheep more than once.

“This singular ovine malady, and the pleuro-pneumonia of cattle, have also an extreme importance in relation to the general inquiry—as examples of diseases which have for the first time been introduced into this country, in our own day, in consequence of the removal of the restrictions which formerly almost entirely prevented the importation of live stock from those parts of Europe in which these diseases have immemorially prevailed.

“The importance of this fact is still further enhanced by the opposite fact, that the rinderpest has hitherto been excluded not only from our own shores, but from countries actually conterminous with those in which this epizootic is most rife, by measures expressly founded on the idea that the disease spreads exclusively by contagion.

“Among human diseases, I have specified typhoid, or intestinal fever, and typhus, for several important reasons.

“1st, Because of the great intrinsic interest of both, and of the large annual mortality occasioned by them.

“2d, Because of the wide differences of opinion at present prevailing as to their origin and mode of spreading, and the very great importance, as regards prevention, that these differences should be reconciled or cancelled.

“And, 3d, Because there already exists, in regard to both—scattered abroad in books, written in many tongues—a far greater mass of precise data touching the points at issue than people generally are at all aware of, and which are fully ripe for generalisation.

“In order to render the inquiry on which the Association is about to enter really comprehensive, it would be necessary to conjoin with the study of epidemics that of the diseases caused in men and animals by living parasites, external and internal.

“A fuller knowledge of the phenomena attaching to the dissemination of the prolific and minute germs of these parasites could not fail to be of great use in helping to the true interpretation of the phenomena which attach to the strictly analogous dissemination of the equally prolific and equally minute germs of the contagious poisons. In particular, it would be of the highest value in showing what is the real worth of the negative evidence, now so implicitly relied on, as an indication of spontaneous origin, and as opposed to the law of propagation by continuous succession.

“Additional reasons for putting the parasitic and the contagious together in such an inquiry are—1st, That at many points the two blend insensibly one into the other; 2d, That with the advance of knowledge diseases are constantly being transferred from the group of common contagious to the group of parasites; and 3d, That there already exists among the most advanced thinkers on these topics, a shrewd suspicion that the two groups will eventually coalesce, and be found to be in their essence identical.

“The only other suggestion I would venture to offer to the Committee is, that in the conduct of their inquiries it would be well to keep the great object of prevention constantly in view.

“And this, not only because prevention is the ultimate aim of all investiga-



tions of this sort, but because, in a degree far greater than is commonly supposed, preventive measures may be made a test of the truth of theory itself. What I mean here may be best illustrated by an example.

“The example I shall take is that of the rinderpest, or cattle-plague. In Austria, Prussia, and other countries immediately conterminous with those in which that fatal pest is most destructive, a very stringent code of regulations for the prevention of the disease is enforced, which is founded, as before remarked, on the idea that this disease is propagated exclusively by contagion. Wherever these regulations have been thoroughly acted upon, there the progress of the pest has been stayed; wherever they have been neglected the disease has spread with fearful rapidity. The perfect success of the method is here a very good test of the truth of the theory.”

#### ON RINDERPEST, OR CATTLE PLAGUE.

On this subject, Dr Budd made a few verbal, but important remarks, and presented some beautiful drawings showing the characteristic alterations on the follicles of the intestines. He indicated that these resembled the ulcerated spots of typhoid in the human subject.

### PHYSIOLOGICAL EFFECTS OF ARSENIC ON THE ANIMAL SYSTEM.

(*From the Scottish Farmer and Horticulturist, September 14, 1864.*)

WHEN the subject of arsenic-eating was first brought prominently before the British public, on the occasion of the appearance of Dr Von Tschudi's paper in a weekly medical journal in Vienna in 1851, the statements made on the subject were received with incredulity by the majority of scientific men. The tonic effects of the drug were so opposite to its generally observed influence, even when small doses were employed, that discredit was freely heaped upon Dr Tschudi's remarks; and this was strengthened by the fact that similar views were found to be entertained by medical men residing in the vicinity of the arsenic-eating districts. Some of the latter, however, and especially Dr Knappe of Oberzeiring, in Upper Styria, made a careful investigation of the matter, and arrived at the conclusion that the practice is extensively prevalent in Styria. Dr Knappe having persuaded an “Arsenikophagite” to come and live under his observation for a few days, was thus enabled not only to see the man take his dose, but also to send to Dr Schäfer, a practical chemist in the Styrian capital, a specimen of the urine passed after the ingestion of the drug, and which was found to contain a quantity of arsenic.

The investigations of Von Tschudi, Knappe, and others, result in the following:—

“1. That in various parts of Styria, and adjoining countries, certain individuals were in the habit of swallowing daily, or twice or thrice a week, or at longer intervals, a certain quantity of a mineral substance called ‘Hütereich’ for various purposes—such as the improvement of the appearance, the rendering the respiration more easy during mountain climbing, as a condiment, as a tonic and stimulant, as a prophylactic against disease, and as a preservation of health; and that this ‘Hütereich’ was arsenic.

“2. That these individuals became, through custom, capable of taking doses of arsenic varying from one grain to several grains daily.

“3. That its more immediate effect on the system was to make them lively, combative, and of strong sexual desire.”

Dr Craig Maclagan, from whose paper the above quotation is made, and who recently travelled through Styria, and specially investigated this matter, farther remarks in the “Edinburgh Medical Journal” of this month: “It is not at all surprising that in other countries there should be a prevalent impression of the non-existence of this practice in Styria, seeing that in Austria itself those



who have not made special inquiries on the subject are generally sceptical as to it. Any one, therefore, passing through Austria and making casual inquiries would most likely be told that the practice of arsenic-eating was not generally known nor believed in. It is not difficult to account for this. The people who eat arsenic have the idea that it is a bad habit, and therefore one to be concealed as much as possible—just like opium-eating in this country; and they have the additional reason for concealing the practice, that from the strictness of the laws regarding the sale of poisons they cannot get the arsenic by open purchase, as the opium-eater in this country can get his laudanum, and therefore they are generally obliged to purchase it from illicit dealers.”

Dr MacLagan narrates two cases, happening under his eye, in which men took doses of arsenious acid amounting respectively to five and six grains. He examined the mouth carefully both before and after the dose, watched the men eat and drink after swallowing the agent, and several hours afterwards collected their urine, which contained a considerable amount of arsenic. Dr Knappe supplied the arsenic, and with his own hands put it into the mouths of the two men. One of these men “took the arsenic to keep him strong, though he had never suffered from ill health. He said he never had experienced any bad effects even when he first began using it, that he had at first taken rather less than a grain every fortnight, that he now took it twice a week, and that on omitting to take it for any longer period he experienced a longing for it, which was relieved by a repetition of the usual dose.” The second subject commenced the practice to protect him against a fever which prevailed in the neighbourhood. At first he took a grain daily for three successive days; and though he did not feel quite well at the time, he never suffered from vomiting or irritation of the stomach. He now generally took about six grains once a week, but with variations in the intervals, there being sometimes four days only, sometimes eight days between the doses. “When he has a distance to walk to his work he takes a larger dose, and is then in good spirits for about eight days. If he, however, intermits it for fourteen days, he feels stiff in the feet, with general lassitude and a craving for another dose. If his victuals are hard of digestion, he takes a dose to assist the stomach; and if he takes a rather full dose, he brings a good deal of wind off the stomach, but never vomits. He stated that his father had taken arsenic before him, and in considerable quantity; and that in the immediate neighbourhood of Liegist numbers use it, several taking it daily, and many in larger doses than he. He said that all who take it are healthy; that he never knew of any one vomiting from its use; and he believed that, like the use of tobacco, if the dose be very gradually diminished, an arsenic-eater can break himself off the habit.”

These results are interesting, as showing the analogy between the effects of this agent in man and in the lower animals, when given in small and gradually increasing doses. It has long been known that arsenic is habitually administered to horses both in this country and abroad, by grooms and others, for the purpose of improving the condition, wind, &c.; and while it was found that these animals gradually acquired the aptitude for taking large doses with impunity, it was supposed to depend on some peculiarity of the constitution, and was not allowed to modify the hypothesis generally received, that the system does not by habit acquire an immunity from poisonous mineral agents. The fact, however, that in man as well as in the lower animals such an immunity can be acquired in the case of arsenic would place this agent in this respect among the class of organic poisons—such as opium, alcohol, &c.—the constant use of which renders the system to a marvellous extent insusceptible of their injurious influence. It further agrees with these agents in exercising a stimulating effect on the system at large, though of a more lasting character, and creating a demand for a constant supply of the material with the alternative of a train of symptoms of a more or less serious character, according as the animal has been inured to its action. The dangerous symptom of arsenical poisoning, sometimes induced when the practice is suddenly interrupted, is a strong argument against the employment



of arsenic even as a medicinal agent for any length of time; and while it is necessary at times to use it in this way, its effects should always be watched with the greatest care; and, above all, when left off, this should only be done after the dose has been carefully reduced to its minimum, and when it has been given for some time with gradually increasing intervals.

It is astonishing the extent to which some animals may be rendered proof against this drug. M. Flaudin found that he could bring dogs to bear doses of fifteen grains of arsenious acid in powder in twenty-four hours without injury to their appetite or health; and to broken-winded horses it has been given for a length of time in daily doses of several drachms with the greatest advantage. It is often given to animals affected with skin diseases, or with broken wind, and with great benefit when a judicious selection of the cases has been made; but it were well if its administration were left to professional men who have acquainted themselves with the various effects of the drug, and who can successfully apply antidotal measures when they threaten to become dangerous. Used by grooms and others for improving the condition of their horses, it is doubly injurious, since not only is there the chance of injury to the animal fed, but, from the quantity of arsenic distributed with its dung, danger may result in a number of ways. In such cases, the agent is usually given in the solid form, and only a small quantity of it is absorbed and enters the circulation, the greater part being passed with the fæces. It is well known that chickens picking up the grains that have been passed whole in such cases are poisoned; and the quantity of arsenic passed in the dung may be estimated from the fact that, when it is given in solution, a twentieth of the dose will produce an equally powerful effect. The other nineteen parts may accordingly be held to escape absorption, and to pass off with the defecations.

---

### REPORT BY MR R. CEELY ON AN OUTBREAK OF CATTLE-DISEASE (ANTHRAX FEVER) AT SWINESHEAD.

*(From the Sixth Report of the Medical Officer of the Privy Council, 1863.)*

IN accordance with instructions that I should proceed to Swineshead, in Lincolnshire, for the purpose of making inquiries into the recent outbreak there of a malignant disease among cattle, sheep, and swine, I arrived at Swineshead on the 1st of August, and have to make the following report.

1. I found the disease had ceased to spread, and that it was expedient for me to visit, for the better prosecution of my inquiries, the veterinary surgeons who had attended the cases in the two affected farms at Swineshead, as well as to ascertain the truth of reports of a similar disease said to have existed or to be still existing in the vicinity. I therefore extended my visit to Heckington, a distance of eight miles, to Donnington about five miles, and to Hubbard's Bridge about three miles, and also to Boston. At Mr Cooper's farms, situated two miles from the village, but in the parish of Swineshead, where the disease first appeared, I ascertained that no death of previously-affected animals nor any new case of the disease in any animal had occurred since the 26th July. Mr Cooper had had twenty-one oxen attacked and one milch cow. Eleven oxen and one milch cow had died, the rest were recovering, though looking out of condition, and still bearing the effects of counter-irritation, which had been applied to their throats and dewlaps. Out of a flock of 129 sheep, ninety had been attacked, and between twenty-five and thirty had died. Out of fourteen pigs exposed, several had been attacked, and six had died, all of the same disease. At Mrs Glossop's farm, about one and a half mile distant from the above, and nearer the village, her only two milch cows had been attacked with the disease. One died, the other recovered. Four pigs were affected, and two died. At Mr Revell's, near Mr Cooper's farm, one pig was severely affected, but recovered. At Mr Smith's farm, adjoining Mr Cooper's farm, a ram died,



but the report of its sudden death, of a similar disease, was unfounded. Its death was the result of chronic disease of the foot, leading to sloughing of the integuments round the knee, from position. It had also fatty degeneration of the heart. The disease of the pigs at Hubbard's Bridge was of a totally different nature to that at Swineshead, being chronic abscess of the subcutaneous areolar tissue, variously located in each subject. I could not ascertain that any other cases of malignant disease had existed or were existing in the neighbourhood.

2. It appears that before any disease was known to exist among the animals at Swineshead, Mr Cooper's shepherd, a stout, healthy, strong, muscular young man, was attacked with what his surgeon denominated *gangrenous erysipelas* of the integuments of the forearm. The particulars of this case, as furnished by Dr Roberts of Swineshead, I think it desirable to record:—"Andrew Pepper, shepherd to Mr Cooper, of Swineshead, was, on Thursday 23d April 1863, engaged in rubbing in some oils, which he always uses, into an ewe's udder which had the *fellon*. He had placed his coat upon a wall of the crew yard, where it remained during the above operation. When putting it on afterwards, he thought he was bitten by some insect several times on the forearm. He rubbed the spots, and they immediately became like nettle wheals, and the arm quickly began to swell. On the following Saturday I saw him. There were then several pustules where the wheals had been, and the arm was enormously swollen and inflamed from the wrist to the shoulder. The pustules speedily assumed a gangrenous state, as did also the upper and under side of the arm. Several of the pustules coalesced at the bend of the arm, and a large slough formed. The arm at this time measured 26 inches in circumference. The symptoms were of a very low type, showing great depression of the vital powers, and he was placed under full doses of quinine, ammonia, port wine, brandy, beef tea, &c., which checked the progress of the disease. The usual local applications were employed,—stimulants, antiseptics, &c., and in about three weeks the sloughs separated, leaving the flexor muscles quite denuded of fascia. Granulation favourably progressed, and in about six weeks cicatrization was complete. I conceived the case at the time to be *gangrenous erysipelas*, arising from poisonous inoculation, and I have neither seen nor heard anything to induce me to think otherwise, though the man declares he had neither diseased beast, sheep, or pigs at the time under treatment, save the usual accompaniments of the lambing season."

3. It was not till six weeks after this event, about the middle of June, that the malignant disease broke out on Mr Cooper's farm. It appeared first on two sheep, soon after clipping. They quickly died, and other sheep became affected. In a fortnight afterwards, the oxen, grazing with the sheep, were attacked. The pigs soon afterwards became affected. They were not, at any time, in direct communication with the sheep or oxen, but daily passed over the ground traversed by those animals. The malady at first was confined to one field, where it was supposed to have broken out. After a time that field was cleared of every animal. It was then dressed with agricultural salt, and shut up for three weeks. Then two lots of beasts were put in to graze. In twenty-four hours, two of the number were attacked, and the disease soon spread to others. Some of the diseased sheep were removed from the field in which they had been attacked, and were brought up to a field near to Swineshead House, a considerable distance, for the purpose of being drenched. In that field was a milch cow, which soon after this introduction was attacked with the disease, and died. The horses grazing with the affected animals escaped. All the animals had been bred on the farm, and were in fair condition, having been lately supplied with oil cake. Two dogs, which had lapped a small quantity of the warm blood of the diseased animals, were, in a few hours, seriously ill, but recovered. Two young pigs ate some of the raw and cooked offal with apparent impunity. Other pigs belonging to a butcher, who skinned and dressed one of the oxen, did the same, with a like result. Several persons partook of the



cooked flesh of the two first sheep that died, without sustaining any harm. The shepherd cooked a piece for trial, ate it, and declared it tasted like liver, having lost its texture. The pasturage of the farm, from the great heat and long drought of the season, was bare. The land, though undrained, was dry, as were also the deep ditches. The canal adjoining the pasturage supplied the drink for the stock. It communicated with the sea at Boston, and in dry seasons and at high tides its water is brackish, as it then was. At such times, the pike therein generally die, as was the case at and before my visit. The canal had *not* been deepened or cleared out for at least eleven years; but I observed some vegetable matter which had been recently taken out of it, strewed on its banks, as I was told, *after* the outbreak of the disease. The chief part of the vegetable matter consisted of the American weed, the *Anacharis alsinistrum*. It was dried up by the action of the sun into a sort of hay, and was readily eaten by the horses and oxen. The adjoining farms, precisely similarly circumstanced, were free from any disease.

4. On the 17th July, during some of the above recited events, one of Mrs Glossop's milch cows was seized with the disease. It died the next day. On that day, the 18th, the other, which was in calf, was attacked, but recovered. On the 19th, four pigs were seized with the disease; two died. The pigs were not in the field with the cows, but were kept near the dwelling-house, fattening for market. Communication with the cows took place when these were brought up to the house for milking. The pigs partook of the milk. To this cause Mrs Glossop is disposed to attribute the attack of the disease in the pigs. I observed in Mrs Glossop's field two calves, two pigs, and several sheep grazing with the convalescent cow. They had grazed there before and during the existence of the disease. They seemed in good health. This farm was differently circumstanced in all respects to that of Mr Cooper, and at least one and a-half mile distant from that. The water in use for drink was in a pond, which, though low, and far from clear, was stated never to be dry. When the cows were brought up for milking, they had spring water.

5. Mr Revell's pig was seriously ill at his residence adjoining the railway station, close to Mr Cooper's farm. Being a butcher, he had been employed to skin the dead sheep of Mr Cooper. His pig fell ill after Mr Cooper had lost seven or eight sheep. It has been intimated that this pig probably ate some of the offal of these animals. The affection of the throat was very severe, and the animal was expected to die, but suppuration ensuing, it ultimately recovered.

6. The cause of the outbreak at Swineshead is certainly obscure. It is seen on two farms widely separated, without communication, and under different circumstances as regards numbers, location, food, and drink; while contiguous farms, similarly circumstanced in all respects, have escaped the visitation. It seems to have arisen in one or perhaps two individuals, and afterwards to have been conveyed to others by immediate or mediate communication. In Mr Cooper's farm there is some doubt as to which field the origination of the first cases is due. Two fields were used for the sheep, and they having been mingled only a day or two before, it is impossible to say whether the two first cases were due to one or the other of the fields. But the fields were contiguous, and the soil and herbage alike.

7. The invasion of the disease was most commonly sudden, precursory symptoms being trivial, or more frequently inappreciable. Its course was rapid and often fatal in twenty-four hours, not unfrequently in one-third of that time. The nervous system seemed struck with stupor or paralysis; there was a sudden prostration of power, quickly succeeded by death. In cases more prolonged, when some reaction of the nervous and muscular systems occurred, the pulse was quickened, but small, weak, and tremulous; but sometimes it was normal. The breathing, at first slightly rattling, became quick, laboured, and more wheezing; often suspicious, with slight cough, and oozing of frothy saliva from the mouth; the breath was very foetid; constipation was eventually succeeded



by foetid and bloody diarrhœa. In most of the animals, the throat and trachœa were more or less affected, but the affection of these parts, with external swelling, and some dysphagia, were more marked in the pig.

8. The phenomena of the disease clearly indicated its zymotic character. The blood seemed to have imbibed a poison which had caused a change in its constituents; a virus appeared to be developed, which had exerted its malignant influence throughout the course of the circulation, and on all the organs and tissues of the animal. Its morbid influence, as shown by its effects after death, was displayed by infiltration of serum or lymph into some structures, especially about the fauces and air-passages; sanguineous congestions and softening of organs and tissues; sanguineous exudation under the serous, mucous, areolar, and cutaneous tissues, and into the visceral cavities. These appearances varied in degree, not only in the different species, but in different animals of the same species. In most of the oxen and sheep the spleen was much congested, enlarged, and softened, perfectly friable. In the examination which I made of the last dead ox, exhumed for the purpose on Mr Cooper's farm, the spleen was less affected than in many of the other cases. In that case, too, there was less congestion, ecchymosis, and infiltration of the mucous membrane and parts about the fauces, œsophagus, and larynx than had been observed before. Sometimes the kidneys and the lungs were more congested than the spleen. In other cases the small intestines contained a large quantity of liquid blood; while in others the bladder contained the most. The ecchymosis of and under the mucous surfaces of the digestive and alimentary canal, and under the serous membranes, varied also in degree. In the pigs, the tonsils and the neighbouring lymphatic glands were much infiltrated; the mucous membrane of the base of the tongue, the fauces, &c., was inflamed, ulcerated or gangrenous. Dr Roberts informs me that he saw, in one case, some of the appearances of *diphtheria*. Mr Wyer, the veterinary surgeon who attended Mrs Glossop's animals, informed me that in one pig he found a perfect carbuncle in the pharynx. I had an opportunity of inspecting the morbid parts removed from the throat of a pig by Mr Dickinson of Boston. They exhibited the appearances of *angina maligna*, with ecchymosis of the mucous membrane of the glottis and trachœa.

9. The cessation of the disease before my arrival precluded my making a physical and microscopical examination of the warm blood of the diseased animals,<sup>1</sup> as well as performing inoculations of it, by the method of Delafond, on healthy animals, with a view to remove all doubt of the true character of the disease, and prove its difference from another equally fatal malady with which he declares it has often been confounded, but from which it is of the greatest practical importance it should be distinguished. But I shall have occasion to revert to this part of the subject. You have, however, already been informed by the highest authority, Professor Gamgee, who had opportunities of observing the disease during life at Swineshead, and inspecting the animals after death, "that the malady had all the symptoms and *post-mortem* appearances of *anthrax fever*, a disease well known on the Continent," especially in some parts of France.

10. Of late years this disease has been observed in several parts of Great Britain, where it has obtained the denomination of "*splenic apoplexy*," from the frequency with which the spleen has been found congested and enlarged. The impropriety and insufficiency of that term applied to a blood disease, although equivalent to those of *Mal de Rate* and *Milzbrand*, so long in use, is too obvious to need remark; but when the same term is applied to two dissimilar blood diseases, it becomes still more objectionable. In the month of

<sup>1</sup> At the acme of the *anthrax fever*, according to Delafond, the blood which *trickles* from an opened vein is thick, very black, incoagulable, and quickly putrifies. That obtained from punctures in any part of the skin, exhibits, under the microscope, crenate and stellate globules.



October 1860, the same disease, Anthrax Fever, broke out in a farm in Buckinghamshire, at the village of Aston Clinton, near Aylesbury. It commenced in the hogs, and from them extended to the cows and horses. Here, twenty hogs, five cows, and two horses were seized and dead in eight days. In the hogs there was much swelling of the parts about the throat with dysphagia. After death, which was very speedy, much infiltration of the fauces, tonsils, and lymphatic glands was found, and a false membrane, resembling that of *diphtheria*, covered the base of the tongue, the surface of the pharynx, the epiglottis, and the glottis. Dr Lionel Beale thus describes the appearances on the parts which he had the opportunity of inspecting:—"The layer of false membrane on the posterior part of the tongue was of a finer consistence, and about the eighth of an inch in thickness. It consisted of a firm material, which was fibrillated, numerous small granular cells, about the size of white blood corpuscles, and epithelial cells of various ages. From its deep surface, small funnel-shaped processes projected to the distance of a quarter of an inch into the follicles in the mucous membrane, at the lower part of which the multiplication of the granular corpuscles was taking place, apparently with great rapidity. It is probable that had the animal lived, the condition above described would have soon given place to the process of suppuration, in which case the mucous membrane in its entire thickness must have been destroyed."—(*Archives of Medicine*, vol. iii. No. 10.) The sheep in the adjoining yard, and the rest of the animals in the affected yard, escaped by a timely and distant isolation, under the direction of Mr Lepper of Aylesbury, the attending veterinary surgeon. The disease was confined to that single farm. A bad atmosphere, in a crowded and ill-ventilated locality, was the presumed cause of this outbreak.

I have been informed of the occurrence of this disease within the last three years in Yorkshire, and also in Northamptonshire. Its outbreak and recurrence in Somersetshire, at Ilchester, was detailed last year in a most able and interesting report by Professors Simonds, Voelker, and Buckman. The report will be found in the *Journal of the Royal Agricultural Society of England* (vol. xciv. Part I., No. 50). Professor Simonds remarks, "that it not unfrequently happens, if an animal bears up against disease longer than ordinary, the duration of the malady being seldom more than eighteen hours, that such changes are wrought in the condition of flesh as render it poisonous. Cases have come to my knowledge in which pigs, having eaten such flesh when thrown into the yard, have died within a few hours. Dogs have also been affected in a similar manner. These facts still further show that this disease is truly one that produces chemical changes in the blood."

During last year some fatal cases are reported to have occurred near Buckingham, also in Derbyshire, Lincolnshire, Northamptonshire, Nottinghamshire, and Staffordshire, as will appear on reference to the "*Edinburgh Veterinary Review*," or "*Annals of Comparative Pathology*," for May to July, or in the reprint, "*Health of Stock in the United Kingdom during the year 1862*," by *Professor Gamgee*.

In Derbyshire it appears that a dog and some ferrets died from eating the flesh of a bull dead of the disease. In Northamptonshire it is stated "that some pigs died from eating the spleen of a diseased ox, and thirteen pigs having eaten the offal of an ox dead with the same disease, suffered severely. Some died, others were slaughtered, *and all were sent to London*."

11. In England the disease appears occasionally to have occurred in, and been confined to, a single animal; but most commonly to have prevailed enzootically on one or more farms, making its first appearance on one or two animals, and extending to others in close proximity, on the same farm, with more or less indications of contagion. On the Continent, it is said to appear sporadically, enzootically, and epizootically. It is considered to be one of the forms of *charbon*, *anthrax*, or *pustula maligna*. It has received the name of *anthrax fever*, *typhus charbonneux sans éruption*. The varieties of charbon or anthrax have been denominated according to the absence or presence of



cutaneous eruption, or the order of occurrence of fever or bubo, carbuncle, erysipelas, or sphacelus of the integuments. It is esteemed to be a most malignant disease, to which all animals are subject, and in general, in some of its forms, considered, and justly so, to be eminently contagious.

It is remarkable that when the disease is spontaneously developed in the horse, the ox, the sheep, and the pig, especially if it run a rapid course, it is not often that a carbuncle or anthrax is formed. In other cases anthracoses or carbuncles are formed soon after the commencement of the disease ; but if the blood of diseased animals becomes the medium of infection to others, and particularly to man, the disease always commences locally by the formation of an anthrax.

The anthrax fever or typhus charbonneux intérieur appears on the Continent to vary in severity in different localities and at different seasons of the year. It is more fatal and more contagious when epizootic. Some of its symptoms, as well as its morbid phenomena, are more marked in some species of animal than in others, and there appears also much variation in the degree of severity in animals of the same species.

12. Neither the intimate nature of the disease nor its positive cause are considered, by the best and most experienced comparative pathologists, to be known. Various causes have been assigned for its origin,—bad or insufficient food, bad or insufficient water, great heat, unhealthy habitations, uncleanness, marshy pasturage, dense fogs, &c. But it is admitted that the disease has been seen under circumstances altogether different from any of the above ; that it has arisen in and been confined to a single farm in a populous neighbourhood ; that it also has occurred in a single animal, and been propagated to others by contagion.

13. No doubt is entertained of the contagiousness of those forms of charbon or anthrax fever attended with external eruption ; but its contagiousness has been denied when unattended with exanthema, especially (says an author of repute<sup>1</sup>) when it affects sheep ; although the author to whom I refer admits at the same time its communicability even to man by the warm blood of the affected animal. Yet satisfactory evidence is on record that this form, like all the others, may be communicated by direct contact, near approach to or communication with the secretions and excretions, or any part of an infected animal, and that the disease may be arrested by isolation. There is equally good evidence to prove also, that all the forms of the disease have co-existed on the same farm, and that they are convertible.<sup>2</sup> It has been stated by veterinary writers that the pestilential bubos and carbuncles which often attend this, and always accompany the other forms of the disease, have been eaten by dogs with impunity, though the virus inoculated on the same animals communicated the disease. The same impunity, they state, has resulted to dogs and pigs from eating the raw flesh of diseased animals. But the reverse has often been observed, both on the Continent and in England ; depending most probably on the parts or the quantity eaten, the length of time they have been exposed to the air, or the severity or stage of the disease. All admit, however, that the warm blood of affected animals consumed by dogs and pigs has caused serious illness, the production of disease or death.

14. There can be no doubt of the general truth of the contagiousness of this disease to man ; though there exists some discrepancy of opinion in reference to the modes of communication. When the disease is transmitted to man from the horse, it is always very dangerous, when from the ox, often so, but transmitted from the sheep, it is often light and sometimes only local.<sup>3</sup> There would appear to be three modes by which severe illness, the disease itself, and

---

<sup>1</sup> Gasparin, *Des Maladies Contagieuses des Bêtes à Laine*.

<sup>2</sup> Gellé, *Pathologie Bovine*.

<sup>3</sup> Heusinger, *Pathologie Comparée*.



even death, may be conveyed to man; viz., 1st, By inhalation through the lungs; 2d, By the cutaneous absorbents; and, 3d, By the digestive organs.

A few cases only are on record where butchers occupied in the skinning and dressing of animals recently dead of this disease, and while the blood was warm, have suffered severely, or lost their lives, without any apparent local affection, or, indeed, any visible cutaneous inlet for the introduction of the poison. But such cases are happily rare.<sup>1</sup>

The most frequent mode, certainly, of receiving the disease is by cutaneous absorption. The warm blood of the diseased animal, even in that form of the malady in sheep which some have denied to be otherwise contagious, accidentally applied to the mucous surface of the lip, or to the slightest abrasion of the cutaneous surface, has given rise to the malignant pustule, and, in some instances, has caused death. The same has happened from a similar incautious application of the morbid secretions or excretions, or the virus of carbuncles, bubos, and other eruptions on the body of the animal, to the abraded skin, or through the bites or stings of insects which have been feeding on the dead carcase.

As to the effects of consuming the flesh of animals affected with the disease, the testimony is very conflicting. On high authority, it has been asserted that the flesh of an infected animal, without cutaneous eruption, may be eaten with impunity, provided the animal has been bled before death. In proof of this assertion, the practice of the shepherds of Languedoc is quoted. They are said to cook the flesh of diseased sheep thus treated, and declare it to be "*un morceau délicat.*" It is also stated that in the epizootic of 1714 in Geneva, there was a constant consumption by man, without any bad result, of the cooked flesh of sheep destroyed by malignant glossanthrax, another form of this disease. And that at Turin in 1805, the flesh of diseased oxen was eaten without any other inconvenience than indigestion to those who had partaken of it immoderately, although butchers engaged in the slaughtering and dressing of such animals became ill. There are, nevertheless, too many instances on record of the deleterious effects on man from the consumption of such flesh. In Hufeland's Journal for October 1834, already quoted, and Gellé's "*Pathologie Bovine,*" tome ii. p. 209, to both of which I would particularly refer, there is indisputable evidence of nearly a whole village suffering severely, and of one death, from malignant pustule, in consequence of eating the flesh of an ox slaughtered while labouring under this form of anthrax fever without eruption.

15. Veterinary writers of large experience have been struck with the resemblance of some of the forms of this fatal disease to the *fièvre intermittente pernicieuse* of Italy. Others have been induced to compare other forms, as seen in some species of animal, with gangrenous erysipelas, malignant pustule, or carbuncle in man. In the pigs, where the inflammatory affection of the throat, the entrance to the air-passages, and the infiltration of the neighbouring glands, is more marked than in ruminants, a striking resemblance has been recognised to *angina maligna* and to *diphtheria* in man.

The cases which occurred in my own neighbourhood three years since, related above, exhibited the morbid appearances of diphtheria. Dr Roberts was struck with similar appearances in one case which he saw at Swineshead.

I have lately been informed by Mr James Freeman, V.S., of Hull, that four years ago, in his practice, he met with several fatal cases of diphtheria in pigs.

The occurrence of the disease denominated *gangrenous erysipelas* in Mr Cooper's shepherd, just before the outbreak of the malignant disease in that gentleman's stock; the previous epidemic of malignant scarlatina in Swineshead and its neighbourhood, succeeded by that of diphtheria which was still prevalent at the time of my visit, are facts of sufficient importance to need a few remarks. The shepherd's arm undoubtedly exhibited the effects of poisoned punctures. Some of the phenomena closely resembled those of the multiple malignant

<sup>1</sup> Hurtrel d'Arboval, Typhus Charbonneux. Gellé, Pathologie Bovine. Hufeland's Journal for October 1834.



pustules described by Mr Bourgeois ("Traité Pratique de Pustule Maligne"). Had the shepherd's disease occurred after the outbreak of that among the animals which he attended, it would not have been difficult to assign a probable cause.

Malignant pustule in man has of late years been noticed in England by several observers. In Somersetshire, where the anthrax fever in animals has occurred and recurred, several cases of malignant pustule have been reported.<sup>1</sup> Early this year I met with a case in a young girl, aged 13 years, in Aylesbury. It appeared in the upper lip, and proved fatal in five days. In none of these cases could any direct or indirect connection with diseased animals be traced. The spontaneous origin of this malady in man, though not wholly denied by continental authors, is certainly deemed to be very rare. (Heusinger relates three cases occurring in persons occupied in the steeping of flax.) It is quite possible that the causes which originate the disease in the lower animals, may give rise, under favourable circumstances, to its development in man, though with more or less of modification.

We need not revert to *ancient* records for proofs of the co-existence of like diseases in man and animals. Within the last 80 years, "*angina maligna*" in man was concomitant with what was then called "*lues bovina*" in cattle and mules in the island of Grenada, both being of foreign introduction. They appeared and disappeared together. In 1795, the same was observed in the island of Barbadoes. This "*lues bovina*" was really the acutest form of *anthrax fever*, attended with severe affection of the fauces and air-passages. The symptoms during life and the *post-mortem* appearances were the same. The effects on those who ate the flesh of the diseased animals were the same, viz., pestilential carbuncles with malignant fever, often fatal.<sup>2</sup> Is the co-existence in Great Britain of the exotics, *diphtheria* in man, and *anthrax fever* in the lower animals, purely accidental?

16. It will be seen that the malignant disease prevalent at Swineshead in June and July last is identical with that which characterised similar outbreaks in other parts of the kingdom. Such have been noticed of late years only, if we may judge by the reports of agricultural societies and the statements of veterinary practitioners. It is not improbable, however, that, unrecognised, it may have existed here in one or other of its forms for a much longer period. In France, the disease has long been known and amply described by many able and experienced veterinarians, as it occurs in sheep and oxen. In other parts of the Continent, as well as in France, it would appear that *anthrax fever*, internal and external, has too often been confounded with another blood disease, which exhibits internal and external hæmorrhages, congestions, and ecchymoses with rapid fatality, some of the *post-mortem* appearances resembling the former disease. It will not, therefore, excite surprise if the term "*splenic apoplexy*," now current in England, should be indiscriminately applied to two diseases differing in their predisposing and exciting causes, their essential characters and ultimate effects, and to neither of which is the term appropriate.

17. Professor Delafond, of Alfort,<sup>3</sup> who, with ample opportunities, has studied both diseases with much care and great acumen, and has described and discriminated them with equal clearness and ability, while admitting occasional difficulty in diagnosis, contends that a correct one, with proper care and attention, can and ought to be made.

He maintains that the disease both in sheep and oxen, called *sang de rate*, *apoplexie de la rate*, *hæmorrhagie intestinale*, *hæmaturie*, &c., ought not to be considered as localised in any one organ; since the active agent of the mor-

<sup>1</sup> Dr Wm. Budd on the occurrence of malignant pustule in England.

<sup>2</sup> Chisholm. Edinburgh Medical and Surgical Journal, vol. vi. Also Heusinger, Pathologie Comparée, Tome, ii. p. 214.

<sup>3</sup> Traité sur la Maladie de Sang des Bêtes Bovines, &c. Traité sur la Maladie de Sang des Bêtes à Laine, &c.



bid phenomena is an abnormal condition of the whole blood, which is superabundant and rich in organic materials, especially the globules. Hence arise congestions, simultaneous hæmorrhages of the spleen, kidneys, lymphatic glands, and intestinal mucous membranes, and not unfrequently external sanguineous accumulations, often rapidly fatal. This disease, which he denominates *maladie de sang*, is caused by hyper-nutrition, derived from natural luxuriant pasturage or injudicious and indiscriminate artificial feeding; that by timely and intelligent care and attention it may be averted, if not successfully treated, when fully formed, and that it is not contagious.

On the other hand, that *anthrax fever*, *fièvre charbonneuse interne and externe*, consists in the existence of a septic principle pervading the entire organism, through the blood, which undergoes a chemical change, rendering it incoagulable, and causing the nervous phenomena of prostration and debility, the internal sanguineous effusions and ecchymoses, the external bubos, tumors, carbuncular infiltrations, emphysemata and gangrene, the rapid putrefaction of the carcase and the property which the blood and the solids possess of transmitting the disease, either by immediate contact or by the infection of a volatile vapour emanating from the blood, the solids, and the secretions. That the nature and seat of the disease, the septic decomposition of the solids, the fluidity of the blood, the softening of the tissues, &c. &c., distinguish *anthrax fever*, after death, from *maladie de sang* and other diseases. That its causes, too, are different, viz.:—1st, Great heat and drought, particularly in marshy and malarious districts, preceded or not by abundant rain. 2d, Location in uncleanly yards, ill-ventilated stalls, sheds, and stables, where the air is full and noisome. 3d, The use of damaged or decayed aliments. 4th, Long and fatiguing journeys. 5th, Contagion.

The importance of a correct discrimination of the two diseases, in a practical, economical, and sanitary point of view, cannot be questioned. The neglect of such discrimination may in some measure account for some of the discrepancies in the statements and opinions of writers relative to the ætiology of *anthrax fever*, and its communicability both before and after death.

Any doubts on the subject of diagnosis, as remarked by Delafond, may be dispelled by a method equally simple, expeditious, and certain, viz., the inoculation of a healthy animal with the blood or serum of a diseased or recently dead one. If by the insertion and retention from 6 to 12 hours of a pledget of lint or tow, imbued with either of these fluids while warm, within a neat incision into the thickness of the skin and subcutaneous areolar tissue, the animal dies rapidly after four, five, or six days of the inoculation, having previously exhibited the symptoms of *anthrax fever*, the result is affirmative; but if, on the contrary, the wound suppurates and the animal remains in good health, the result is negative as regards that disease, but affirmative as to the case being one of *maladie de sang*.

18. The carcases of animals dying of *anthrax fever* ought to be immediately buried deeply in the soil, as much for the benefit of the owner as the safety of the public.

The fatality of this disease, its communicability to all animals, and even to man, under certain circumstances, would justify the most rigid legislative enactments, and claim increased vigilance and intelligence on the part of inspectors at slaughter-houses, markets, and fairs.

The institution and resolute supervision of public slaughter-houses, wherever practicable, would, no doubt, accomplish much in defence of the public interest. But there is a class of men actively occupied in the purchase and sale of diseased meat, whom present laws seem inadequate to restrain.

# EDINBURGH VETERINARY REVIEW

AND

## Annals of Comparative Pathology.

---

### ORIGINAL COMMUNICATIONS AND CASES.

---

*Veterinary Records.* By G. ARMATAGE, V.S. to the Marchioness of Londonderry.

#### ŒSOPHAGUS VENTRICULOSUS, OR SACCULOUS DILATATION OF THE GULLET; VOMITING; CHOKING, ETC.

CASES of the above nature, with their attendant phenomena, are of the greatest interest to the physiologist; and as they occur from time to time under the observation of the practitioner, facts are not wanting to establish a certain connection in their general characters and effects. Our *répertoire* of facts in relation to anatomy and physiology may not be so replete, probably, as could be wished; it is our duty, therefore, to add each our mite in order to raise the vast superstructure of scientific knowledge, as by a scrupulous record of cases, and careful collation of them, much of their profound character will become clearer. Phenomena hitherto indescribable, and also unaccountable in one instance, will probably find their approximate revelations in another. As we read of the acts of others, we doubtless reap a compensating benefit and proportionate stimulus to be doing something; in return, therefore, as an acknowledgment for the assistance thus derived from those gone before—pioneers in veterinary science—are these manuscripts forwarded for publication.

The horse has been said “never to vomit,”—“*Le cheval ne vomit point* ;” and published memoirs are not wanting, “*ou l’on donne les raisons pourquoi les chevaux ne vomissent point* ;” our record of cases, however, furnishes us with facts to the contrary.

In 1852<sup>1</sup> appeared a report by Mr J. S. Gamgee, entitled “An Inquiry into the Reasons why the Horse *rarely* vomits;” a summary of which appeared in the “*Veterinarian*” for July, August, and September of that year; and an original article, also from the pen of Mr J. S. Gamgee, in the same journal for March

---

<sup>1</sup> London Journal of Medicine.



1857, from which much scientific information and explanation of the *rationale* which gives rise to the action under modified circumstances may be gathered.

Mr W. Percival, so far back as 1825, stated "that nature has not endowed the horse with the *faculty of vomiting*," and "whenever it happens, whether the act is a voluntary or involuntary one, it must be ever regarded as one *out of the course of nature*."

While, however, we regard this latter statement with all the consideration which it deserves, we must not altogether close our eyes to facts, which, as they occur, would appear to lead to a contrary conclusion. My memory and note-book serve towards the production of instances in which the act of vomiting has occurred altogether to be regarded as one performed independently of an unnatural state or condition, disorder apparently and alone furnishing a true key to a solution of the phenomena. Such are also the cases furnished in the "Review" for October 1861, by Mr R. L. Hunt, M.R.C.V.S., Birmingham; also by M. Romant, p. 277, in the number for April 1862; and by Professor Gamgee, senior, in October 1862. Hitherto we have regarded the act of vomiting in the horse or ox—particularly the former—as associated only with some pathological action or condition of a fatal character, as rupture of the stomach or diaphragm; a supposed fact thus giving rise to an accepted impossibility. Our Continental friends, also, in their operations and experiments upon the stomachs of dead animals, and vivisectional acts upon those living, appear not only to have fallen into an error, but perpetuated it to our own delusion. We English veterinary surgeons, as a rule, hate theory and love practice; but how much better would it be if there existed a greater disposition for instituting some of the more important experiments, without leaving the same to others willing to undertake them, and to rest satisfied with results as they are presented to us.

Before the appearance of the "Inquiry" of Mr J. S. Gamgee, the statement, "*Le cheval ne vomit point*," was virtually accepted; but are we to believe that horses continued for years prior and up to this statement being propagated, without being subject to the same causes which are known to produce the action now? Or, are we to draw down the reproach upon ourselves, and admit that, with all our much-loved practice, we have never discovered its occurrence? The cardiac sphincter, valvular obstruction, isolated condition of the stomach, obliquity of the entrance of the œsophagus, all constituting the bandage upon our eyes, have been withdrawn, and we are compelled to admit that we have become scientific and theoretical; nerves and nervous influence, muscular contraction—in short, cause and effect—become apparent. Vomiting is at length a reality, and we are satisfied. "The horse *rarely* vomits," we are now told; but however rarely, there is given much opportunity for physiological reasoning as to its dependence upon

causes within or out of the course of nature; as I have before said, conclusions and cases seem to point to a condition considerably in advance of that with which the phenomena had previously been associated.

My experience of such cases certainly is not of the most extensive character, but such have occurred which are demonstrative of the tenableness of the views I am substantiating. Mr Percival lays stress on the absence of impediment at the pylorus as being the reason why the horse so rarely vomits; but so far from believing that emesis in him is an impossible act, considers that in order to secure its establishment, pyloric obstruction must be set up, as spasm, or paralysis, *pro tempore*.

It is a common practice among the farmers of South Yorkshire to send their horses considerable distances for the purpose of carting lime from the Derbyshire lime-kilns for agricultural use, when two nights and a day are often occupied upon the journey. The animals are fed upon the principle of plenty; a large meal of hay or chaff, with corn, forming a dry mixture, is given previous to starting, and repeated at intervals throughout the journey, when the cold lime-water from the springs of Derbyshire being given, produces all the effects desirable for a case of colic.

Three horses, owned by one person, had reached a distance of sixteen miles from home on one of these journeys, and were put into a stable at a roadside public-house, where symptoms of colic soon manifested themselves. A horse was borrowed, and ridden in haste to apprise the owner, who called upon me to accompany him to the place. Two animals had recovered under *native* remedies—*gin, butter, and scot*; the third, although free from pain, looked *sick as a horse*; countenance haggard, pulse weak and accelerated, and there existed evidences of depression to a very great extent. Around the nostrils were attached portions of dry and hardened egesta, and a sour smell continued to be detected. The ears and legs were cold, and all food refused, borborygmus continued, but the bowels had not acted. My next attention was directed to the straw and floor of the box, and I discovered a quantity of chaff, beans, bran, &c., which had constituted the food of the morning at home and on the journey, mixed with mucus and froth, leaving no doubt of the truth of the statement of the attendants, that the horse had *spewed*. Upon further inquiry, I found the animal had suffered extreme pain, and rolled very much during the paroxysms, the vomiting occurring when he had risen from the ground, from which considerable relief appeared to be derived. Spts. ammon. aromat. was given after a dose of cathartic medicine, warm rugs to the body, and bandages were applied to the legs, and a man left to stay with him the few hours which remained of night. I saw him again after a short rest, and found him considerably improved, when the other animals were despatched to their destination for lime, my patient



to resume his journey homewards when they returned. Nothing further took place worth record, than that the horse was alive and well two or three years afterwards, but I never heard of his being guilty of emesis.

Similar cases have occurred on several occasions among heavy horses, to which my attention has been directed for an attack of colic, most of whom were gross feeders and animals of great capacity and visceral development.

Mr Thomas Thompson, Sunderland, gave me the following particulars of a case of emesis in the horse.

On July 9, 1864, he was called to see a grey colt three years old, which was said to be suffering from gripes and sickness. When he arrived, the animal was lying and rolling in pain, frequently rising as in colic; tympanitis present; pulse slow, weak, small, and irregular; temperature natural. The animal was made to rise, and when he had done so retchings came on, and with very little preparatory effort, vomited through the nostrils as much matter composed of grass, mucus, and froth, as could be held in both hands held together. Spts. eth. nit., eth. sulph., spts. ammon. aromat., tr. aconite, tr. ginger, and tr. opii, were used, but the animal continued to vomit, at periods of fifteen minutes, upwards of an hour. Quiescence was gradually restored in four hours, since which time the horse has continued well and healthy.

The long continued drought of 1864 had deteriorated pasturage, and rendered the small quantity of grass which remained very dry and innutritious, no doubt causing the extreme symptoms of indigestion. Although not ascertained, I have no doubt the large intestines were considerably impacted, as well as the stomach; in fact, Mr Thompson asserts, stercoral matters were brought up towards the close of the case.

Mr Luke Scott describes a case of vomiting in an aged mare used for farming purposes, which had exhibited symptoms of impaction of the stomach, from a full meal of oats which had been swallowed very greedily. There was no disposition to roll or lie down, as all symptoms were speedily developed; vomiting had commenced before he arrived, about a pint of matter being ejected from the nostrils each time, which occurred at intervals of ten or fifteen minutes if the animal was left quiet and alone. If the head was raised from the very low position in which it was held, vomition came on instantly. She recovered without treatment.

*Œsophagus ventriculosus*, or saccular dilatation of the *œsophagus*, doubtless also favours the expulsion of food from the stomach; two cases of which have come under my notice, exhibiting, however, degrees of difference in their exact nature.

A grey colt five years old, bred from a Suffolk mare by a thorough-bred horse, the property of the late Sir George Dash-

wood, Bart., Kirtlington Park, Oxford, was the subject of repeated attacks of colic, with violent attempts to *belch*, as expressed by the messenger. Usually the attacks came on after the morning meal, when probably the food supplied the night previous still to a great extent occupied the intestines. The animal was a good feeder, but not considered a ravenous one, and scarcely ever known to be affected but at the times stated.

The attacks were ushered in by restlessness, pawing with the fore-feet, attempts to urinate, &c., symptoms which would gradually increase in their intensity, and assume a very violent form. Next, attempts to eructate would be made, the nose being brought into contact with the breast repeatedly, and a spasmodic effort at the same time made by the muscles of the neck, chest, and abdomen, until emesis was accomplished. The pulse seldom assumed any irregularity of moment, and during these paroxysms the colt *rarely lay down or rolled*, a fact which first attracted my attention, and induced me to attribute the affection to some anterior part, as the stomach, pylorus, or duodenum. In watching carefully, I observed large pellets of food repeatedly pass as high upwards, within the gullet, as the bifurcation of the jugular vein, and, during slight retching, slide down again. This I saw upon several occasions, for half an hour after the administration of a dose of physic, when the action gradually ceased. During an attack of acute colic, this action was most severe, and could always be detected when the animal had eaten too much.

By my advice he was sold.

Another case, but of less intensity than the above, came before my notice about the same time, viz. 1861, in a cob horse about 14-2 high, of the Welsh breed, belonging to a farmer near Islip. In this instance no symptoms of colic appeared, the pellets of food after a full meal passed upwards and downwards with regularity, but which admitted of some aggravation, amounting to excessive preparatory exertion, resulting in the end to forcing matter from the stomach.

In both cases I noticed a considerable dilatation of the organ, but the contained pellets varied in size.

Emesis in the horse is now admitted not *impossible*, but of *rare* occurrence; and by some altogether an act arising from, or giving rise to peculiar conditions serious in their character. Of the truth of the latter supposition we have abundant proof, but the occurrence of vomiting in animals which live for some time afterwards and in the enjoyment of perfect health, points to states or conditions of a different character. To insure the completion of the act, several causes must be apparent, *e.g.*, organs filled to repletion, with exertion more or less of a hurried or excessive nature, food which requires a great amount of time for digestion; to which a draught of cold water will have the effect of swelling the contents, whereby we have distention, augmented probably



by resulting fermentation, and paralysis, *pro tempore*, of the coats of the stomach, by which the mechanical obstruction—persisted in by Flourens and others—the folds of mucous membrane, are obliterated or drawn aside, rendering the passage through the cardiac orifice clear and unimpeded.

That the horse is not nearly so susceptible to the power of medicines which excite emesis in other animals there is no doubt; but that the act is not accomplished after the exhibition of such, is no proof that he is altogether insensible to their effects. That he does not vomit depends upon the absence of one or other of the conditions necessary to the whole. But we cannot shut out from the view the effects manifest upon the exhibition of nauseant medicines, and we must suppose thereby, that although symptoms of spasmodic retching, &c., are not produced, he suffers not a bit the less otherwise. We are void of information as to the consequences of the administration of emetics to the horse, when the whole of the conditions necessary are present on the part of the gastric apparatus to insure emesis; and we may inquire, What would be the effect of injection into the veins of a tincture of hellebore upon a horse suffering from acute indigestion, in which the preparatory symptoms of vomiting are present? a state not uncommon in many cases of aggravated colic, which veterinary surgeons attendant upon the heaviest feed of horses occasionally witness.

One important feature must not be overlooked in connection with this subject—that of the function of digestion—which, in my opinion, has a material effect in rendering emesis a rarity. Instances of the extreme rapidity with which food or medicine, &c., disappear from the stomach of the horse are very numerous and incontrovertible, and call for earnest consideration at our hands in more circumstances than one. The important bearing of this fact upon the subject under deliberation may be a sufficient reason for reproducing here a report of an experiment by Professor Gamgee, senior, from the September number of the "Review" of last year, at page 577.

"On 30th July 1862, an aged horse, of sound constitution, about to be put away through being affected with chronic lameness, was made the subject of the following experiment.

"The horse having been, up to this time, well kept on oats and hay, was in no other respect changed or restricted in diet previous to the experiment, except on the evening before, having had no corn, and only a small quantity of hay given him; but his head having been left free, the horse ate particles of straw from his litter, as he was accustomed to do. On the morning above named, I gave him a ball, composed of seven drachms of Cape aloes, combined with one drachm of glycerine; the ball was rolled in ordinary white wrapping paper.

"After the medicine was swallowed, the horse drank three or

four mouthfuls of water, and then ate about half a pound of hay.

“Thirty-three minutes after the ball was taken, the horse was killed by the common slaughterer, in the ordinary way adopted by these experts, viz., by dividing the large vessels, and letting the blood flow.

“Death followed in a few seconds. Fifty-five minutes after the death of the horse, the skin having been removed in the meantime, I opened the abdomen, from which the stomach, with intestines, liver, spleen, &c., were removed, a ligature having been previously applied round the œsophagus, close to the stomach; second and third ties were made at the origin of the duodenum, the stomach was then separated, a long incision made through its coats, in order to expose the contents.

“About a quart of semi-fluid matter was found in the stomach, amongst which was conspicuous the white paper in which the aloetic ball had been wrapped; the paper was perfectly clean, not a vestige of the mass of which the dose was composed was to be seen, the smell of aloes was the only evidence furnished of the presence of that drug. I took the paper up in my hand, and some particles of hay and pieces of straw which were floating with it remained attached; these I placed in a clean envelope, and afterwards exposed the whole to dry in the sun for preservation. The coats of the stomach were in a perfectly normal state. I next slit open the duodenum, where the usual change the contents had undergone was observed beautifully perfect; the smell of aloes was there also unmistakable.

“A second slit into the small gut was then made about its middle, and a third near its termination with the large intestine. In the second opening a slight smell of aloes was still experienced, but in the last it could not be distinguished.”

In a mare which was in the agonies of death, it might be said—for she died within an hour after the administration of a ball composed of ammonia-pulv. scillæ and ext. belladonna—and was skinned and opened immediately, the whole time not exceeding one hour and forty-five minutes, no trace of the medicine could be detected, save the odour which continued throughout a considerable distance of the small intestines. The paper, however, was found perfectly clean.

I have purposely given boluses to animals suffering the last moments of irrecoverable disease, to test the power of the digestive organs; and invariably found nothing but the paper in which the dose was wrapped.

What pertains to medicines applies also, to a certain extent, to alimentary matters. Horses and ponies used in coal-mines commence work very early after a meal of corn and hay, &c.; in some cases nothing is allowed until their return to the stable, after a fast of twelve or fourteen hours; in others hay or chaff is



allowed. Taking this fact into consideration, when animals have been suddenly deprived of life by a fall of stone, crush between two trains of full coal tubs, &c. &c., very shortly after their being put to work, I have had frequent cause for surprise in total absence of food from the stomach and small intestines,—facts which are not without their value under various circumstances to the veterinary practitioner.

These facts before us, then, must point out ample provision for their fulfilment; and we may doubtless look upon such an endowment as opposed to the principle required for promoting emesis; and being, as we have a right to suppose, not only essential but elaborate, the more neutralising will it be to the states bordering upon that phenomenon. Bayle demonstrated, in 1861, the inertness of the stomach in the process of vomiting; its functions are the opposite and must be overcome by conditions in excess of its natural power; a fact which teaches how much the system must be influenced by the agents before it is in a condition to effect the process.

Of this we have practical proof in the various cases of disease which affect the alimentary canal, in which vomiting is produced,—to one or two I will briefly refer—and action of an antiperistaltic nature set up. Any one who has hitherto described a case of vomiting in the horse has not failed to take cognisance of the utter prostration which results; and finds an echo even in the human subject, under greater advantages and circumstances of an inherent character.

1. A young brown mare, after suffering repeated attacks of colic, at length presented symptoms of approaching dissolution; emesis being accomplished several times before death, which certainly, and with great rapidity, accelerated the termination of affairs. Three large fibrous tumours were found attached to the mucous surface of the ilium by a pedicle; inflammation had taken place, and consequent upon the action of the viscus, dislodgment of one of the smaller ones; a fourth, which was found in the part near the stomach, doubtless having been forced on its way thither by antiperistaltic movement.

2. A pony, used in one of the coal-mines of the Marchioness of Londonderry, died after much suffering, indicative of some serious affection of the bowels, accompanied by retchings, and in the small intestine was found a calculus surrounded by diseased tissue, in which ulceration had been set up, allowing the stone to be partially evacuated; in the stomach a second was found, no doubt also carried by the reverse action of the intestine.

Antiperistaltic action is frequently witnessed in the œsophagus during severe cases of choking, especially where the seat of obstruction is low down the tube. Several cases remarkable in their character, particularly in cattle, have come under my notice.

That sterling practitioner, Mr Luke Scott of Hetton colliery—for whose opinions and ideas I am not alone in entertaining a great amount of respect—describes a case in which this action was well marked; and where simple means effected highly successful results.

A dark grey mare, six years old, had been choking five hours. Upon his arrival, he witnessed profuse salivation, with discharge of ropy mucus and oil from the nose and mouth; at intervals there were spasmodic jerks of the head, the mouth being approximated with the chest, arching of the neck, and all the necessary acts of emesis. Immediately oil was given it was expelled by the nostrils. The animal had been feeding upon dry bran, an accumulation of which had taken place about two-thirds down the neck, exhibiting a hardened sense to the touch, and apparently immovable.

By persevering manipulation with the hands for fifteen minutes, the mass was divided and partially disintegrated, which was further assisted by a small quantity of oil, resulting in perfect relief to the animal.

In the cow vomition also occurs at times. I recollect an old beast which frequently secured to herself relief from a distended stomach by vomition.

Mr G. Robertson describes a case of emesis in a cow in the "Review" for March 1862; and another also by Mr W. Maw, p. 237, April of the same year.

An illustration of sympathetic emesis is described by Mr W. Colbeck, pupil to my friend Mr J. D'Arcy Peech, M.R.C.V.S., Wentworth. Several cases have also come under my own observation. I shall close this article with a brief description of one.

A short-horn cow belonging to a poor farmer in the county of Oxford exhibited symptoms of choking and sickness, as described to me, whereupon Mr Smith, the village quack, was called in, and pronounced her to have a "*great tarmit in her wizzen*," and accordingly down went the probang at once, and with it the animal fell to the ground as if shot. The symptoms growing rapidly worse, I was summoned in haste to the suffering creature, and gave my opinion of the case as severe and extensive laceration of the œsophagus, advising the owner to have the animal destroyed; with a request that her case should be ready for examination early the following morning. Shortly after my arrival home, the son called upon me with the intelligence that the cow was considerably better; no doubt having become easier, these poor people, in their anxiety about their valuable property, had taken for granted the appearance of a state which they would naturally wish to see realized, and urgently craved a bottle of medicine to "*warm her up*." Without destroying the fond hopes with which he had so closely followed me home, I furnished the required dose, and allowed him to depart; when, scarcely had he



reached the outskirts of the town, I was summoned to another farm in the same village, and lost no time in again visiting my patient, the poor man's cow, which I found lying down, and exhibiting signs of the greatest distress.

The draught, consisting of a small quantity of Spts. Eth. Nit., was poured into the mouth, when the poor animal rose and reared, shook its head violently, and rushed like a mad creature from the hovel across a small paddock, and round it several times, and dropped from sheer exhaustion. The owner at length acted upon my advice, and next morning attended for examination of the body.

The œsophagus was found to be completely torn through the whole of the coats, and by the force used in *unchoking* the animal, the tube was pushed or doubled down amongst the muscles of the neck, where it was surrounded by matter forced from the stomach during the act of vomiting.

A small piece of irregularly shaped turnip was found in the lower portion of the gullet, between the first ribs, a rent having been made through the coats on one side considerably below the place where Mr Smith's acts had caused complete rupture. The laceration was of anterior date, and the turnip exhibited signs of decay. Around the gullet also was present a quantity of food, which had been there some time, and all this without having set up signs of disturbance, except at a time some weeks before, when, after slight choking, the turnip was supposed to have been dislodged, but in reality the cause for the present aspect of affairs had been instituted.

The passage of the œsophagus had not been interfered with to a great degree, as the piece of turnip had partially insinuated itself within the torn portion, thus allowing for some time without perceptible inconvenience the passage of food and fluids. An accumulation of the former having taken place without the passage, had given rise to the symptoms which received the superlatively wretched ministrations of the cow leech.

Whether these remarks, which have extended much beyond the limits of the space originally intended, will prove of any value, as men's thoughts which have received a tangible form, or remain to denote the existence of vagarian ideas, time alone will show; however, in the search after truth, we should expect to be speculative even at the risk of being concluded as a theorist and utopian in character. There is a charm, and every word is encouragement, in the old proverb, "*Felix qui potuit rerum cognoscere causas.*"

*Effects of White Hellebore on the Horse.* By the SAME.

I WAS called in a great haste to see an aged grey harness horse suffering from colic. On my arrival I observed the following symptoms:—pulse 84, full and soft; respiration quick and laboured, nostrils dilated, countenance expressive of anxiety, ears and legs warm, slight colicky pains, bowels costive—borborygmus, anorexia. Auscultation gave little or no murmur. V.S., viij. lbs., and a strong dose of “Spts. Ammon. Aromat.”

I left to obtain an injection pipe, and on my return found a complete mitigation of all symptoms.

After making some particular inquiries, I obtained the information that the previous evening the animal had exhibited symptoms of staggers, and had received the attention of a neighbouring practitioner, who gave in the first instance a ball composed of aloes and nitre, and after some hours a pound of sulphate of magnesia. My attendance on the occasion having been sought on account of the former person being from home, and he being expected on his return, I arranged to go back again shortly to inform him of my proceedings, and give up to him his case. At 11.30 P.M. we met, and although the animal was certainly making good progress, our friend declared there were serious obstructions internally, and one or two balls would be necessary, one of which was immediately given.

Anxious to know his treatment and its expected results in a case I viewed principally as one of congestion of the lungs as proved by the history of the case, I yielded to his invitation to remain. In one hour from the first ball being given a second was administered; the pulse had now become smaller and weaker; froth and a ropy saliva hung from the mouth; the countenance reassumed its anxious expression; respiration became shorter and quick, and the nostrils again dilated. He was now pronounced safe, a few hours seeing him perfectly restored. We turned away from this case, and I pressed for the particulars of this mysterious treatment, when I was informed that each ball had, I think, one dram of Pulv. Helleb. Alb. contained, which was given to produce a secretion from the mucous coat of the intestines and so liberate them, salivation being the guide to its being established. It was now 3.30 A.M., the first dose was administered at 1.30.

At 4 P.M. the same day I paid the animal a visit. The breath was foetid; salivation profuse; retchings came on, and he died the same evening; pronounced unable to withstand the treatment.

Some time afterwards I met with an old and valueless horse suffering from acute distension of the stomach, and bearing in mind the symptoms which denoted the exhibition of *Veratrum*



in the former case, resolved to make a trial of it under these circumstances to see if actual vomiting would occur. The pulse, however, was quick and feeble, symptoms generally of a nature indicative of a fatal and speedy termination.

Half a dram of Pulv. Helleb. Alb. was given in a bolus, and at the expiration of one hour a second; a rosy saliva shortly commenced; pulse became smaller and quicker; pain subsided. In another hour the third dose was administered, when all symptoms became aggravated, retchings appeared, countenance became extremely anxious, and at length the animal stood motionless for some time, with ears and legs cold, and eyes protruded and blood-shot. He frequently swallowed spasmodically; depression became extreme together with the whole of the symptoms, and three hours from the exhibition of the first dose he dropped dead.

The stomach was very full of food, being stretched from internal pressure; the orifice at the œsophagean canal slightly open, the folds of membrane being partly drawn aside, and small portions of cut hay were lying within. The colon was also very full and inflamed.

No trace of either ball or paper could be detected when the animal was opened four hours afterwards.

On the sixth of the present month, a small pony died in one of the pits from extreme prostration and emaciation attendant upon chronic disease of the lungs. When opened, the stomach was greatly distended by gas, about half a quartern of pultaceous matter being inside. The cardiac orifice was firmly closed, it was with great difficulty that I could introduce my little finger, and inclosed within the folds of membrane was a narrow strip of faschia, such as we meet with in the flesh of a shoulder of mutton: about one inch lay within the canal and one and a-half within the stomach.

I can account for the presence of this faschia by the fact, that as the pony was a favourite with his driver he shared his *bait*; but as the poor thing had ate nothing for several days, fluid medicine regularly given, and water drank by him, I can give no better reason for its position as found, with one or two fibres of hay, than the supposition that as violent retchings preceded death it must have been forced there.

---

*Worm in the Eye of the Horse.* By THOMAS HICKMAN, Esq., V.S.,  
late Bengal Army.

TO THE EDITOR OF THE VETERINARY REVIEW.

EDINBURGH, 13th October 1864.

SIR,—Amongst the numerous diseases that the horse is liable to, there is one commonly termed “worm in the eye.” Doubtless, it is a disease; for, if our patient could articulate and explain his

feelings, when the vermiform stranger is snugly ensconced in the front chamber of the only suite of apartments in his physical frame that glories in a bow-fronted window, he would very likely desire to eject the unwelcome tenant, and thus to feel himself at ease again. India appears to be the country of all others where this singular disease is frequently found ; and I have never heard, although I have often inquired of veterinary surgeons of lengthened service, as to any probable "reason" why this should be so.

It is said to be frequently connected in some way (which abler medical reasoners than myself could probably satisfactorily explain) with the disease termed "kumree," or paralysis of the nerves of the "lumbar region," and that, should the worm be withdrawn from the eye, "kumree" oftentimes makes its appearance. I have had some half-dozen cases, and never once met with this result. It is rather difficult to detect ; for, in the early stage, the irritation of the slippery occupant of the front room of the "eye" produces a cloudy aspect to the aqueous humour, the pupillary opening being also persistently contracted, and a suffused condition of the eye, eyelid, and conjunctiva generally. As the eye is frequently inflamed by the irritation of hot winds, sand, dust, insects, &c. &c., it often occurs that the real cause of the horse's admission into hospital escapes the detection of the hospital attendants and veterinary surgeon ; and it may not be until the subsiding of the inflammation, that attention is directed to the hiding-place of the intruder. A little of the extract of belladonna, placed underneath the eyelid, will have the effect, in a short time, of drawing the curtain, and affording the observer a more extensive view of the anterior chambers and their contents. The worm will most generally be found behind the iris, and below its lower margin ; but should it be at all excited, it may be distinctly seen floating, or rather actively swimming about its little ocean, in the manner you see water-snakes propel themselves in their element. And when you have a clear case of this kind, I don't know any disease of the horse that vies with this in point of interest and curiosity ; and one is almost inclined to exclaim with the philosopher, whilst examining a "fly in amber,"—"how the devil did it get there !"

It being taken for granted that our patient wants his tenant evicted, the mode is to secure the horse with a couple of holtches, one on the nose, the other on the ear, one fore-leg being held up by an assistant ; then, lancet in hand, calmly await a favourable opportunity, and make a slight puncture in the direction of the pupillary opening, and at its lower margin, avoiding the possibility of touching the iris. The aqueous humour will then escape, which should be collected on a piece of white linen ; the watery matter is quickly evaporated, leaving the residuum, a thin, opaque, thread-like film, which is the worm, "high and dry," and



out of its element. The treatment should now be to place the animal in a loose box, shut out the sun-light, and place a clean white cloth over the eye, keeping it saturated with cold water, or weak sedative lotion. A "laxative" may be desirable, and walking exercise after sunset, or rather later in the evening. Diet should consist of mashes, with a little oatmeal in lieu of "grain," the usual Indian horse corn. In a few days there will have formed a slight eschar over the clear cut incision; and in about a fortnight nearly all trace is lost of the puncture.

Should you deem this effusion of any assistance, for the purpose of awakening an inquiry as to the nature of the disease, and its supposed connection with "kumree," you may save its probable fate—viz., interment in the waste-paper basket.—I am, Sir, your most obedient servant,

THO. HICKMAN, V.S.,  
Late Bengal Army.

---

*Vaginal Polypus.* By ROBERT PATTINSON, Veterinary Student,  
Dearham, Maryport.

ON the 13th February last, I was called to see a two-year-old short-horn heifer belonging to William Sewell, Esq. of Hayborough, near Maryport. I found her suffering from a vascular tumour, growing from the supero-lateral part of the vagina about four inches in front of the vulva. The tumour was of considerable size, dilating and filling up a great portion of the vaginal cavity, and protruding from the external orifice as well. The mass was attached to the supero-lateral part of the vaginal wall by a pedicle of about four inches in thickness.

After consulting with Mr Gamgee, Principal of the New Veterinary College, I proceeded, on the 30th April, to remove the tumour with an *écraseur* kindly lent me by that gentleman.

I had the beast slung, fixed her hind extremities, passed the chain over the neck of the tumour, and gradually detached it. The operation was perfectly successful, not the slightest hæmorrhage resulted, and no subsequent uneasiness was evinced by the heifer. By simple attention to hygienic measures she has made a satisfactory recovery.

*Remarks.*—The tumour has an oblong outline, with a depression or hilus in the middle at one of the sides in which the pedicle is inserted. Within this hilus the surface is smooth and glistening, while on the opposite or convex aspect, it has a nodulated appearance, being studded with rounded projections of very variable size. After having been steeped in spirit for eight months it has a firm, dense consistency, and on being cut into, feels somewhat crisp under the knife. The cut surface is smooth, and shows numerous small fibrous bands intercrossing in all

directions, and leaving small soft and vascular interspaces. Under the microscope it appears to be almost exclusively fibrous, though there is a small proportion of cellular elements.

Cases of this kind illustrate the great superiority of the *écraseur* over most other measures for the removal of pedunculated tumours from natural openings. It at once obviates the difficulty met in applying a ligature, and the danger of hæmorrhage from the use of the knife, and possesses the recommendation of freeing the animal at once from all annoyance caused by the presence of the tumour, and entailing very slight risks in the after results.

---

*The Breeding and Management of Horses.* By JOSEPH GAMGEE, Senior, New Veterinary College, Edinburgh.

MY paper in the "Edinburgh Veterinary Review" for last month, entitled "Observations on the English Blood-horse," having been freely commented on in the "Sporting Gazette" of 8th October, I feel it due to the subject and to science, to afford such further explanations as I am able to do.

The advantageous positions, which my antagonists hold before their readers, compared to those enjoyed by myself,—one of them the editor of a popular sporting journal, and the other a frequent correspondent, whose renown has even overspread the world through the columns of the "Times," present to me so formidable a task, that it is only from a deep sense of duty, and my usual determination not to flinch from it, that I set myself to accomplish it.

I shall firstly take up the queries and objections of the editor, and thanking him for the compliments paid me in his opening paragraph, defer notice of the last sentence in it, till I come to the incidental question, cited also by the other critic. I beg still to adhere to my former proposition, that, in the recent discussions, "the blood-horse has received a lion's share of attention," to the inconsiderate omission or abeyance of the high claims to attention which all classes of horses demand. I duly allow for the editor, who is constantly engaged in the narration of sporting matters, or in preparing *racy* articles, such as will not overtax his readers, who, he tells us, "care mainly about the horse on the turf and in the field." Whilst myself no less an admirer of these, I equally appreciate the other classes, and the many noble qualities they possess, for the services they render, to agriculture, to commerce, to the requisites of the army, and for all purposes of recreative pleasure; therefore, to me the cart-horse, exerting his powers at a dead pull, is as interesting an object of study as is the struggle in the race of another class. In my early days, when riding powerful horses over heavy land, I was led to admire how



the clever, large (that is, wide and powerful) horses got over the great double fences under heavy weight; and such early lessons having, moreover, been confirmed on my mind by time, systematic investigations, and experience, they cannot be dispelled by novelty and fast propensities.

I hold, then, that the blood-horse forms only one component or a class among many, important indeed, but whether first or second in the order of importance in a national point of view, is a question of comparison, on which I do not feel called to enter.

The explanation afforded by "the editor" of the circumstance which led to Hambletonian's name and character being discussed at length, in no way affects the position I took up in the matter; the fact is, I cannot see that any deductions from Hambletonian's career can help to solve the questions of importance raised.

I cannot be led to participate in the editor's sympathy, or to take up "a parable" against epistolary correspondence in the "Times." On the contrary, so long as no editorial sanction or interference is brought to give character *pro* or *con.* to the discussions, I believe that the more freedom allowed the better. I think that not to have given place to Dr Shorthouse's recent letter, which was reproduced in the "Sporting Gazette," and commented on by others as well as myself, would have been somewhat analogous to compressing steam, and giving greater force with the risk of explosion.

The other criticisms by "the editor" are in general participated in by the erudite correspondent of the "Sporting Gazette," and I shall therefore couple further remarks, with my reply to those of Dr Shorthouse.

The learned Doctor having gone beyond the bounds of the immediate questions involved, for the grounds of his critical remarks on my papers, says that, "A few years ago he startled the sporting world by declaring that roaring race-horses made very little noise." As detached sentences are often made to mar rather than to convey the sense of the writer, I will relate the circumstance under which they were written, and subjoin the connecting links to show the spirit of my argument.

I was led to make the above remarks under the following circumstances:—After the skeleton of Eclipse had been procured for the New Veterinary College of Edinburgh, and had been transferred from London to the northern capital, many reports, some of them vague and of improbable import, were put in circulation, and amongst those, some related stories of the extraordinary performances of that horse, while others were very positive in their assertions, that Eclipse was a horse of peculiar form, that he galloped with a straddling gait with his hind legs, and lastly, and not least absurd, that he was a "rank roarer" to such extent that he could be heard across Epsom Downs.

It was the last oft-repeated tale which led me to take up the question, when the words referred to appeared.

I said then, and maintain now, that the assumption of Eclipse being a roarer, was most inconsistent with all that is known about the history of that grandest of horses. All that rational men of the present day can require in order to dispel such assumption, has been authentically brought before us, in the history of Eclipse's brilliant turf career, he having beaten all the horses he met, mostly, it is said, in a canter, over all distances; and therefore was withdrawn from training, an unbeaten horse.

I said, that such performances were incompatible with the notion of a horse being a roarer; hence the use made of my words, quoted by Dr Shorthouse. Other writers, including "editors," attempting to invalidate my opinion, set to work to find out the names of horses which were great in performances on the turf, after they had become confirmed roarers.

Assuming that there had been some reason for the report about Eclipse making some kind of noise, I suggested that he was most probably addicted to making the peculiar noise with his nostrils in his slower gallops, which in our time is understood by the term fluttering; which is a sign of stamina, health, and generous disposition; it is only heard in slow work, when the horse is fresh, and may be compared to the ploughboy whistling and chaunting notes as he blithely walks up the furrow in a spring morn, while an infirm one would pant at going the same pace.

In support of my views, and to give the probable explanation, I mentioned the fact, that I had known some of the descendants of Eclipse to be flutterers, and some of these the best amongst the wiry sons and daughters of Whalebone, and of Emilius also; but I never knew a roarer amongst these. Indeed the playful flutter, or puffing, occurs in the expiration with the non-extended nostril; the noise always ceases when the nostril becomes expanded under speed, where the roarer, the really infirm horse, begins to feel distressed.

I said before, and now repeat, that though we may hear the wheezing cab-horse in the street, no sane man would run such an invalid animal amongst good and sound horses over a distance; and if any one were ready to do so, I should consider that a clear case was presented for the interference of the law, under Martin's Act.

I am next accused of being so credulous, as to believe in all that has been said of Flying Childers, including his running a mile in a minute. I beg to tell the Doctor that I did nothing of the kind; but allowing for mistakes, and some distortion of reports, which were more than a century old, said there was as much reliable traditional report about Childers, in addition to written history, as could be found to support the character of horses, near our own time. And clearly, the reports stating the horse to have



been possessed of incomparable speed, afford no ground for our assigning him to have been a slow and indifferent horse; any more than because they tell of his being brown, we should insist that he was blue.

If I lacked an instance to illustrate my meaning, when I said that the traditions about Childers, were as worthy of credit as some of those relating to horses of recent times, Dr Shorthouse has now himself supplied that want. Let us suppose the possible case of the turfite of a century hence, reading over the accounts of horses of old, and after scanning over the names of Eclipse, &c., he comes to Dr Shorthouse's description of the Flying Dutchman and Voltigeur, which, I will ask the impartial judge, will read most like, and be most in accordance with, the truth—the old or more recent of the reports?

Next, I am brought to task for having “caused somewhat of a sensation, by announcing that breaking down is an impossibility and a myth.” Here Dr Shorthouse courteously, and I acknowledge properly, challenges me to give proof; and I confess, that without any desire to withhold the truth, I have been prevented from going into the matter further at present for the following reasons:—Firstly, as the accident and pathological condition of the part are inseparably allied to its anatomical construction and functions, I should, in order to do justice to my labours, and in the absence of such means of demonstration as are afforded by exhibiting the natural structures to an audience, have required some elaborate drawings to illustrate the text. Let it not be understood that I deny the existence of injury with some of the main features attributed; but I do deny that the structures hitherto supposed to be, are the real parts affected, or that the accident happens in the way hitherto assumed.

As to the words “break down,” they apply to the case in the same sense as we apply them when we say that a thing has failed, a scheme has broken down, or has fallen to the ground; the words so used conveying a figurative, but not a positive meaning.

I should, no doubt, long since have published a more full account than I have done on the subject of the injuries happening, which go under the common term of “break down,” had I seen that the primary questions of construction and functions of parts involved had been more readily taken up. In addressing these remarks to a medical gentleman, there should be no difficulty in assuring him that the nature of injuries can by no possibility be understood until the natural structures, the seat of injury, are made familiar; and equally true is it that to appreciate the conditions which succeed—how changes take place—in other words, to understand disease, when total ignorance of the natural functions prevails, is out of the range of rational procedure; for these reasons I have worked on, believing that the time is not distant when the fruits of my labours will be welcomed.

Had I possessed the independent means of Freeman, with the artistic talent of Sir Charles Bell, and also his persuasive eloquence, more might have been accomplished, but I cannot reprove myself, as having lacked in duty on this matter.

On "Cross-Breeding," without pretending to an understanding of the philosophy of language, I profess to have an ear which, by habit, has become accustomed to attach certain meanings to given words. And according to my own intelligence, I should regard it correct to say, that a sleight-of-hand mare, put to a horse of the Touchstone or Birdcatcher breed, would form a likely cross to lead to a successful issue. But to use the phrase in a general sense, by calling the offspring of such combination cross-bred stock, would not, in my opinion, be making a happy selection of words for the occasion. It was precisely a parallel case to which my attention was drawn, and which led me to take up this question—that of calling Harkaway, Plenipotentiary, Voltigeur, and West Australian cross-bred horses, which, if not a contradiction of terms, seems at least to be pedantic phraseology.

On the other hand, if one man, proposing to sell his horse to another, were to describe the animal as a clever cross-bred Irish hunter, I can see no ground on which the buyer could rest any complaint, on afterwards discovering that the horse was not thorough-bred.

I believe that appeal to authority would elicit the decision, that in the supposed case cross-bred and half-bred must be regarded as synonymous expressions.

Of the two phenomena which Dr Shorthouse invites me to see, the first I shall regard as noticed in my general remarks on roaring; and as the second only concerns my position by making references to my own labours—relating to the length of the metacarpal and metatarsal bones of the horse—I shall extend further notice, in some measure commensurable with the primary importance of the subject. Dr Shorthouse says, "If Professor Gamgee will honour me with a call, I will show him an old roan mare of mine which, with the greatest ease, and without distress, can trot eighteen to nineteen miles within the hour, and, although about 15 hands high, her hocks are as close to the ground as a Shetland pony's; her metacarpal and metatarsal bones are, in fact, two or three inches shorter than that of any other *animal* I ever saw of her size, and yet she possesses fine speed. I would also refer him (Mr Gamgee) to the horse Sir Tatton Sykes, a horse possessed of extraordinary speed, as an example of shortness of shank-bones, showing a combination with great speed."

Finding my position thus assailed in its least vulnerable part, my readers and critics will, I trust, pardon me, if in the interest of scientific truth, I dwell at length on the question thus raised.

What sort of stuff can "the editor" and Dr Shorthouse imagine



I am made of to be capable of writing so much of what they attempt to show to be erroneously false nonsense, on questions regarding the economy of horses' limbs? or, in the possible case of there being some truth in my propositions, do they believe me to stand with my hands folded while they try to invalidate what I have proved? I confess to esteem my critics more than *silent* friends, yet I cannot lose sight of the fact that their criticisms are of such a nature that even their questions (which, when good, are the next best things to instructive advice) are wanting in suggestiveness, as might have been expected, when it is known that they take up questions of high importance, which had escaped the penetrating minds of men of all times until now; and yet neither of them show that they have devoted much time to the matter in question. The first of my two critics accords me credit for giving free scope to thought, the other proffers me instruction; but could neither of them see that I am a working-man, and hence of independent thought and knowledge, real, and not assumed, unlike offshoots of free thinking; and could the other not see that I am a matter-of-fact man, not to be deluded by imaginary ideas?

When I showed for the first time that length of metacarpal and metatarsal bones in animals generally, and in the horse in particular, is an essential condition in the construction of their limbs to speedy action, with economy of muscular power, I neither wrote nor expressed a sentence on the matter until I had worked out the subject, sufficient for the extent to which my communications, in detached parts, went.

Not only have I demonstrated and proved that slow animals have short metacarpal and metatarsal bones, and that speedy animals are as necessarily endowed with long metacarpal and metatarsal bones, and that such construction and energy of function are relative phenomena, but I told all who had courage to read for themselves how they might prove the correctness of the views which I had laid before them.

In mentioning certain renowned horses whose skeletons I believe to have been preserved, I advised that the given bones of such horses should be compared with those of other horses of less distinct breed, but known to be of about the same height. That proposition was, I think it will be allowed, plain; and an unexceptional test was presented, as I myself had used it. When I mentioned the two or three skeletons which I know of—of Eclipse, of Touchstone, and Blink-Bonny—I submitted that the bones of either might be compared with a host of inferior horses; besides which, since horses of renown have usually been buried on the estates of their owners, it would not be difficult to recover the skeletons of many of the best horses of the present century. And were it known that not only the solution of questions could be thereby arrived at, but that prompt and wide-spread knowledge

would result through such means, many noblemen would let the bones of their old favourite horses be taken from the clay and put to bleach in the air, for the good of science.

With regard to Dr Shorthouse's statement about the horse Sir Tatton Sykes and his short shank-bones and great speed, unless the metacarpal and metatarsal bones of that horse are produced and authenticated, the case can avail us nothing; no mere report can be admitted against positive evidence, which abounds. As to the doctor's own roan mare, I simply say that he is deluding himself, and that no horse or mare can be found in Great Britain, differing, in length of the bones referred to, from those of his own mare, to anything like the extent he assumes.

Fortunately for Dr Shorthouse, as well as myself, I never make bets, or else I should challenge him with several wagers. And, firstly, I would propose to tell, though four hundred miles apart, the length of the bones of his mare's legs, with more accuracy than he will be able to do, by measuring them in the living animal. In the next place, let him tell me the breed of his mare, and I will engage to find horses of her own height, with longer, and some with shorter metacarpal and metatarsal bones than his own mare exhibits. Lastly, he will not find half the difference he mentions between his own mare's bones and those of the worst bred horse or mare of her size, which will furnish the shortest shank bones, and those of the best racer on the turf, which will present the longest.

In insisting on the importance of a correct knowledge on this question, of relative length of metacarpal and metatarsal bones, and the speed of horse, I am only noticing a phenomenon (a leading one, however), and one of those which goes to make up a whole and beautiful system. It is out of the range of reason to expect that facts can be appreciated and the laws of the animal economy to which they relate become comprehended, without some pains being taken to learn the whole; therefore, in stating and exposing, I am not responsible for the way others see, or refuse to either see or hear on the matter. Students will, in due time, be led to look into important questions of the kind involved, and by degrees will learn; and then critics, and their organs of usefulness, may reflect and extend established knowledge.

As well as replying to, I may anticipate some possibly forthcoming questions, which, proceeding without connection, or the contemplation of any system, may assume that there is scope for dwelling indefinitely on a phenomenon; and had I not thought it easier to appreciate an inch than its fractional parts, I might have extended my discourse to the showing of the same relationship between the length and energy of force common to the other bones of the foot of the horse, viz., the pastern and pedal bones, as I have discovered to be constant with those in immediate con-



nection above, there being no exception to the law, as I have described in the case of the metacarpal and metatarsal bones.

I have been led to think, from an anecdote which used to be related by Professor Coleman, and attributed to John Hunter, that the great physiologist and surgeon, was on the verge of seeing into these questions, when he said that "the duck was admirably constructed for swimming, but not adapted for running."

In conclusion, though I can lay claim to no such encyclopedical knowledge as Dr Shorthouse wields, yet, in obedience to the rule "that one good turn deserves another," since he has met me in my own field of research, I venture to trespass a few steps only, on his side; and ask him, firstly, whether he ever knew a sculptor to select for his model a man who had very short hands and feet, relatively to his size?<sup>1</sup> Secondly, did he ever know a man so formed to be a great pedestrian, or an athlete, in the full sense implied? Again, recalling to mind the graceful figures on the stage, and in the drawing-room, as seen in the dance, did he ever observe there a preponderance of numbers to have short feet, and hands as broad as long? No. And the law to which these observations point is no part of a perishable code formed by man, or under man's administration, but is immutable.

---

### *On Entozoa.*<sup>2</sup>

THERE are probably two reasons, which, apart from all others, sufficiently explain why the science of helminthology, from the time when Rudolphi published his "Entozoorum Synopsis" (1819), to the present, has been cultivated with greater success and industry by the Germans, than by the scientific men of other countries. The first is the extraordinary prevalence of parasitic diseases in central Europe, and the second, the aptitude and predilection of German professors for the investigation of subjects of a recondite nature. The mere fact of worms inhabiting the

---

<sup>1</sup> I wish particularly to impress on the reader's mind, that in my reference to the feet of animals, including those of man, with the hand also, when saying that length of metatarsal and metacarpal bones confers energy of action in the limbs respectively, I, of course, take it as implied that symmetry be perfect; otherwise I may be called on to reconcile a correct doctrine, applicable to normal structures and health, with disordered conditions due to laxation of ligaments, altered form of bones, and other sequences.

An apparently long and flat foot in man, with horizontal instep, is of necessity weak, as results from analogous defective form in all other animals. Symmetry in animal construction, and also as seen in artistic works, concentrates appearance, and yet comprises substance, and confers strength. In Nature's inestimable works, in the construction of the foot, we find the realisation of "*multum in parvo*."

<sup>2</sup> Entozoa, an Introduction to the Study of Helminthology, with reference more particularly to the Internal Parasites of Man. By T. Spencer Cobbold, M.D., F.R.S., &c., London: Groombridge & Sons, 5 Paternoster Row.

bodies of men and animals has been known from time immemorial. The history of physic teaches us indeed, that the ancients attributed many fatal disorders to living organisms of low degree, which were sufficient to induce a great variety of the ills human flesh is heir to. The organisms—contrary to what we now know to be the truth—were supposed to spring from corrupt matter which accumulated in the viscera of men and animals, and the most horrible stories were framed in explanation of the origin and effects of parasites. It is not to be wondered at that the exaggerations of those who invented these far-fetched and unfounded theories were followed by a reaction, and the opinion gained strength amongst medical men that worms were harmless creatures, often existing in the bodies of the higher orders of animals, for a wholesome, beneficent, though mysterious purpose. There was certainly more truth in the view of the ancients, that creatures which live in or on others, do so at the expense of the host they inhabit, than that they contribute to the excitement of any healthy function. So far as we have yet learned entozoa are worse than useless for the promotion of health in the bodies they invade. Indeed, not unfrequently the prevalence of internal or external parasites is an indication of failing health, not caused, but aggravated by these parasites; and it is now well known that causes which contributed generally to weaken man or the domestic quadrupeds, render these very susceptible to invasion by insects or worms, which then induce special forms of disease, and not unfrequently kill.

To the student of medicine, the science of helminthology is one of the most attractive he can turn his attention to, after having grappled with and overcome some tedious preliminaries. The language of the science is bad and difficult. It has not been made better by recent writers, and a perfect confusion of tongues is threatened by the system of naming after men any new specimens of worms, which the comparative anatomist or medical and veterinary practitioners happen to fall in with. It is the duty of every observer to simplify science as much as he can, and not to encumber a new branch of human knowledge by creating a special language for which the most accomplished scholar can prepare no key. We therefore object to Dr Cobbold's *Bilharzia*, *Köllikeria*, *Simondsia* and similar names, which can in no way be rivetted on our memories. A far better system of nomenclature is adhered to when such a name as *Campula oblonga* is created for a fluke, characterized by a zigzag-like form of digestive cœca and general oblong shape. We doubt much if scientific men care much to have worms called after them. It reminds us of the extraordinary case of an admirer of Gray the well known naturalist, calling a species of donkey, which he fell in with in his travels, *Asinus Gray*. Many writers err worse and more frequently, than Dr Cobbold in the directions referred to, and in-



deed we write to induce our professional brethren to read the work which has led us on the present occasion to refer to the subject of entozoa. The learned Doctor has prepared a treatise which will do much to advance the study of helminthology in this country, and not only is it the best, but it is the only one which at the present time those who read but English can peruse with a view to the acquisition of recent information on this all-important subject. We must not alarm veterinary surgeons especially by attacking the technicalities, which are kept out of sight as much as possible in the splendid volume just published by Messrs Groombridge & Sons, and indeed we think that if any of our readers are inclined to purchase it, and we trust they all may be, they will find much entertaining reading in it, and all it contains cannot fail to be very instructive.

There are more reasons than one which urge us to recommend veterinarians to study entozoology. It tends to enlighten us on nature's laws governing health and disease; it teaches us how nothing is left to chance, and how to secure the propagation of one of the humblest, and, apparently to us, one of the vilest of living organisms, the higher orders of animals, and man himself, are sacrificed. It explains the origin of certain diseases, and it teaches us how they may be prevented and cured. It shows also what a close relation exists between the diseases of men and animals, and last, though not least, the veterinarian can appreciate how his labours may prove of direct and incalculable benefit in protecting man from painful and fatal maladies due to the ravages of parasites, which the domestic animals harbour for us in their interior.

"The study of the internal parasites of man and animals," says Dr Cobbold, "is one of boundless interest; and from the multiplicity and variety of creatures thus found associated by one common habit of life, zoologists have deemed it not only advantageous, but even absolutely necessary, to consider them collectively in the light, as it were, of a separate science."

The entozoa often differ from each other in form far more than they do in habit and abode. Some comparative anatomists dispose them in their classification tables according to their structural affinities, but Dr Cobbold wisely follows the plan of gathering them together in a separate class. He says, "The happiest, and perhaps, after all, the most truly philosophic way of studying the entozoa is to regard them as a peculiar *fauna*, destined to occupy an equally peculiar territory. That territory is the wide-spread domain of the interior of the bodies of man and animals. Each animal or "host may be regarded as a continent, and each part or viscus of his body may be noted as a district. Each district has its special attractions for particular parasitic forms; yet, at the same time, neither the district nor the continent are suitable localities as a permanent resting-place

for the invader. None of the internal parasites 'continue in one stay;' all have a tendency to roam; migration is the very soul of their prosperity; change of residence the *sine quâ non* of their existence, whilst a blockade in the interior, prolonged beyond the proper period, terminates only in cretification and death."

Dr Cobbold has suggested a new scheme of classification, in which the whole of the entozoa are grouped into four orders, viz., *Trematoda*, or sucking worms; *Nematoda*, or round worms; *Acanthocephala*, or horn-headed worms; and *Cestoda*, or tape-worms. The general anatomical and other characters common to each of these orders are considered in the first part of Dr Cobbold's work. In the second part there is a special history of the parasites which infest man, and as many of these infest the lower animals, much information is furnished of direct interest to those who study the diseases of animals.

The first human parasites to which Dr Cobbold refers at great length is the liver fluke, *Fasciola hepatica*. Flukes seem to enter the human body in one of two ways. "In their highest larval condition, the parasites either penetrate the skin directly from without, or they are carried into the stomach along with our food, out of which later viscus they grope their way into the liver. It is highly probable that both these methods of invasion are adopted. In the first case, it is clear that the free larvæ will have been obtained from water used to bathe the person, or from the naked skin being exposed to the surface of moist grass or herbage, wherein the larvæ or their molluscan hosts abound. In the second case, they will have been obtained by the individual's having partaken of water-cresses or other field herbs in a fresh or unwashed state. Even celery and other market-garden vegetables may harbour the fluke-larvæ, especially in cases where such gardens have been watered by the contents of weedy ponds and stagnant ditches. As other parasites may be conveyed to us in the same way, it behoves all parties concerned in the sale and preparation of vegetable food to subject such matters in every case to a thorough douche with clean pump or reservoir water. Only after this simple cleansing can the aforesaid vegetable products be declared free from trematode and other helminthic larvæ. It is a noteworthy circumstance that most, if not all, of the cases of *Fasciola hepatica* infesting the human body have occurred in individuals of the lower classes, who would naturally be careless as to the thorough cleansing of water-cresses and other vegetables procured from the garden or the field."

With regard to the prevalence and propagation of flukes in the lower animals, Dr Cobbold says—"Correlating all the known data afforded by the experience of our best veterinary authorities, and by the recent experimental investigations of Continental helminthologists, I may here state in a tentative manner the conclusions to which a due consideration of all these facts in-



vitably leads. The deductions here recorded may eventually require modification in respect of their minor details; but in the main they will be found substantially correct, and therefore be likely to convey that kind of information which can scarcely fail to interest those more immediately concerned in the preservation of cattle, as well as those also who regard the subject from a wider social point of view. It is even now encouraging to think that when a little more light shall have unveiled all the missing links now wanting to complete the chain of evidence, the promoters of science will more hopefully seek to enlighten those who, in so far as *natural history* knowledge is concerned, are unwisely clinging to the idle "tales of a grandfather." Surely an enlightened public will no longer esteem the vague opinions of a bygone age to be more worthy of credit than the cleverly enunciated facts of recent scientific discovery.

"1st, The *Fasciola hepatica*, or sexually mature liver fluke, is especially prevalent in sheep during the spring of the year, at which time it constantly escapes from the alimentary canal of the host, and is thus transferred to open pasture grounds.

"2d, It has been shown by dissections that the liver of a single sheep may at any given time harbour several hundred specimens of the fluke, and it is certain that every mature entozoon will contain many thousands of minute eggs.

"3d, The escaped flukes do not exhibit powers of locomotion sufficient to prove them capable of undertaking an extended migration, but their movements may subserve the purpose of concealing them within the grass or soft soil where they have fallen. Their habit of coiling upon themselves probably facilitates the expulsion of their eggs.

"4th, The eggs can only escape from the oviduct of the entozoon one at a time, but there is no doubt whatever that prodigiously large numbers of loose ova are expelled the infested sheep in the same manner as the flukes themselves.

"5th, By the dispersing agency of winds, rain, insects, feet of cattle, dogs, rabbits, and other animals, and even by man himself, the eggs are carried in various directions, not a few of them ultimately finding their way into pools, ponds, ditches, canals, and running streams.

"6th, The freed eggs, at the time of their maturity, contain ciliated embryos capable of active progression when brought in contact with dew on the blades of grass, rain-drops, pools of water, ponds, and lakes. The prolonged action of the moisture without, aided by vigorous movements of the perfected embryo within, serves to loosen the lid-like end of the egg shell, by opening of which the animal is set free.

"7th, The ciliated embryo, which is furnished with a solitary cross-shaped eye, after a longer or shorter period of activity, loses its ciliated covering and becomes comparatively inert. It

alters its form, and probably soon afterwards gains access to the body of a fresh-water mollusc, or possibly into the tissues of a land snail.

“8th, Once within the viscera or substance of its so-called intermediate host, the non-ciliated larva probably becomes transformed into a large sac, and develops new larvæ within its interior. These sac-like larvæ are called “nurses” or “sporocysts,” or, when rather highly organised, “rediaë.”

“9th, The contained nurse progeny or higher trematode larvæ are probably furnished with tails, as in other flukes. When fully developed they constitute the well-known cercariæ.

“10th, The cercariæ have a tendency to migrate from the bodies of their molluscan hosts, and they are quite capable of an independent existence. During these wanderings in the water they are occasionally brought into contact with the human body, and in a few instances appear to have succeeded in penetrating the skin.

“11th, It is not certain whether the cercariæ are taken into the bodies of quadrupeds when the latter are drinking water or eating solid food, but it is probable that they are passively transferred in either way. It is not unlikely that they are often swallowed while still resident with the bodies of their molluscan hosts.

“12th, From the digestive organs of sheep or cattle the cercariæ make their way into the liver, in which new situation they probably part with their tails and become encysted. This constitutes the so-called pupa stage.

“13th, The pupa thus encysted for many weeks, or even months, attains a higher organisation, at last becoming converted into the sexually mature *Fasciola hepatica*. It gains access to the liver ducts, then passes into the common biliary outlet, and from thence is transferred into the intestinal canal, being finally expelled its vertebrate host in the manner previously described.”

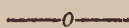
It is not our intention at present to refer to any more of the fluke forms which are found to infest man. The ravages, as described by Dr Cobbold, committed by *Distoma hæmatobium*, or, as he calls it, *Bilharzia hæmatobia*, are sufficiently severe to demonstrate that parasites are at times productive of serious injury, and even of death.

The section of Helminthology which has startled the scientific world most of late years is that referring to the tapeworm, and on these we shall say more another month.

(To be continued.)



## REVIEWS.



*The Laboratory Guide for Students of Agricultural Chemistry.*

Arranged by ARTHUR HERBERT CHURCH, M.A., of Lincoln College, Oxford, Professor of Chemistry in the Royal Agricultural College, Cirencester.

WE hail with satisfaction the appearance of the above little work, the contribution of a highly accomplished scientific chemist to the library of the agriculturist.

Although many works have appeared from time to time explaining the general principles of agricultural chemistry, the want has been long felt by the agricultural student of a practical chemical hand-book adapted to his particular requirements. The ordinary manuals of analytical chemistry, although well calculated to impart a knowledge of the general principles of the science of chemistry, very naturally contain very little information concerning the applications to the other sciences; and the student of metallurgy, technology, and toxicology is therefore obliged to have recourse to special treatises which supply him with the detailed information which he requires. The student of agricultural chemistry has hitherto had no practical work on agricultural analysis to refer to. The want has at last, we are happy to see, been supplied by the appearance of the little book which we now warmly recommend to the attention of our agricultural readers.

Professor Church's manual supplies the special information which a chemist, who has not devoted his time to a study of agricultural chemistry, and who is yet called upon occasionally to make agricultural analyses, would wish to obtain. This is not, however, the chief object of the book, for besides being a useful little work of reference, it forms a tolerably complete little manual of analytical chemistry, especially adapted to the use of agricultural students.

The first part of the work is devoted to qualitative analysis. In thirty-three pages the author has included a short outline of the subject, which he supposes will suffice for the purposes of the student of agricultural chemistry. In order to simplify this section, "not only all the rare elements, but also all those that are not necessary constituents of any agricultural material or produce, are omitted." It is a point for discussion how far such limitation is expedient. Too much attention cannot be devoted by the student of chemistry, whatever may be his ultimate object in acquiring a knowledge of the science, to the study of qualitative

analysis. We know from personal observation that agricultural students exhibit a very great tendency to get over the, to them, often tedious study of qualitative analysis in as short a time as possible, in order to devote themselves as soon as possible to what they erroneously consider *more practical* work—to analyse guanos, soils, &c. In some laboratories, we are aware, it is the custom to second the wishes of the student, and to allow him, after a few weeks devoted to qualitative analysis, to proceed to the quantitative analysis of articles of agricultural interest. We are persuaded that the system is an excessively bad one, and feel convinced that, in order to attain excellence in agricultural chemistry, it is absolutely essential to devote very great attention to qualitative analysis. With a complete knowledge of this department of chemical analysis, it is *very* easy to become an expert analyst; the student who has thoroughly mastered the different methods of *separating* the different elements in a complex inorganic mixture, will readily learn how to estimate them; whilst he who is devoid of this knowledge, may be able to go through the analysis of a guano or oilcake, according to the plan of his teacher, but will be altogether at a loss how to sketch out for himself accurate schemes for the analysis of substances new to him. Holding such views, we must confess that we cannot admit that the first part of Mr Church's book is as complete as we should wish it to be. A perusal of it will, we feel persuaded, rather encourage the tendency which we have spoken of as common among agricultural students—to think lightly of qualitative analysis.

For our own part we should feel inclined to recommend the student of agricultural chemistry to master some one of the larger works in qualitative analysis (and we must here confess our great partiality for the work of Dr Fresenius), and then to take up the study of the second part of Mr Church's book.

The second part of Mr Church's book is devoted to the quantitative analysis of agricultural substances. The schemes for the analysis of different substances are characterised by great clearness and simplicity, and the methods employed are such as will yield accurate results. This section of the book, and it is by far the larger and more important one, is excessively well arranged, and we feel sure will be of the greatest value to those for whom it is intended. In a work of the size it is obvious that only such methods can be given as are most likely, on account of their facility and rapidity of execution, to be practically useful. Many very accurate methods, if failing in these respects, must necessarily be omitted. It appears to us that an account of the quantitative estimation of starch and sugars, by means of standard solutions of copper, might, however, have been included with advantage. The method also recently introduced for esti-



inating phosphoric acid, by means of standard solutions of uranium salts, also appears to us as very likely to be of very great use in the rapid analysis of manures; but on this point we speak without experience, having merely used the method, and with very admirable results, in the estimation of the phosphoric acid in urine.

In conclusion, we beg again to recommend Professor Church's work to all who intend devoting themselves to the pursuit of agricultural chemistry, as supplying very effectually a serious want in chemical literature, and as very well fitted, especially when used in connection with more extensive works on qualitative analysis, to make them accurate and expert analysts.

# EDINBURGH VETERINARY REVIEW

AND

## Annals of Comparative Pathology.

---

### THE PRESIDENT'S DINNER.

Few things prosper in this country without a feed. In founding a charity, a number of people propose a dinner with a Duke in the chair; and although the guineas paid to the purveyor of table delicacies would have been better spent in the form of contributions to the proposed institution, it is a *sine quâ non* that the charitable contributors be warmed into good humour and generosity by an extravagant entertainment. If a merchant, a doctor, or an advocate aims at attaining a high position, it is necessary that he should give dinners, and thus supporters and clients are gathered together. The Veterinary profession, and its Institutions, have neglected the British system of feeding into prosperity; and nothing can be more dull than the annual meeting without many of the active and independent members who live too far from London to attend to routine business, and to a somewhat slow evening repast, which is often not unmingled with acerbity. We have been strongly in favour of provincial Presidents, as the Royal College of Veterinary Surgeons is not a metropolitan, but a national institution; and if we have any cause of complaint with past selections, it might arise from the want of an Irish or Scotch president figuring already in the list. That there has not been a Scotch president may in part have been due to us, who could not understand how an individual should be placed in the foremost position by a body whose interests he has perseveringly damaged. Of the English presidents, chosen from the provinces, Mr Hunt of Birmingham has been the first to show that it is possible, convenient, and useful, to have a dinner beyond the sound of Bow Bells. Perhaps no veterinary dinner was ever



more successful than the recent one at Birmingham, and its effects will be lasting, as it is hoped it may induce others to do as Mr Hunt has so well done, and it is likely to lead to a number of country members taking more interest in the profession than hitherto. There has been too much of London in veterinary matters, and we cannot say that London politics have done any good to our profession. Veterinary associations have sprung up, and are acquiring great influence; and they have not been called into existence in the smoky atmosphere of the metropolis, but in the country, where there was a mass of redundant energy and vitality, which only required to be marshalled in proper form in order to be expended for the good of our calling. The independent, healthy tone of thought which has sprung up of late was fairly represented at Mr Hunt's dinner; and we congratulate our President on the success of a new experiment which may, in its results, prove of great importance to the great body of veterinarians, who have been too much taught to believe that it was impossible to do anything for the good of our profession beyond the metropolitan boundaries.

## ROYAL COLLEGE OF VETERINARY SURGEONS.

—o—

## QUARTERLY MEETING OF COUNCIL.

At a Quarterly Meeting of the Council, held the 5th day of October 1864,—

PRESENT:—The President, Professor Spooner, and Messrs Braby, Broad, Brown, Cartledge, Ernes, Greaves, Harpley, Harrison, Helmore, Lawson, Mavor, Moon, Pritchard, Robinson, Secker, Thacker, Wilkinson, Withers, and the Secretary.—The President in the Chair,—

The minutes of the preceding meeting were read and confirmed.

A copy of the letter of condolence to the widow of the late Professor Miller was read, together with Mrs Miller's reply, thanking the Council for their kind expression of sympathy in her late bereavement.

The Secretary read the correspondence which he had had with the Secretary to the Scotch Board relative to a breach of the bye-laws in the case of Mr James Taylor, who had been examined, and obtained a diploma, without having strictly complied with the provision of Bye-law 27.

On the letters being read, a short discussion took place, when it was moved by Professor Spooner, and seconded by Mr Brown—"That Mr James Taylor, having been admitted to his examination for the diploma of the College, and passed by the Court of Examiners, without having given the required notice to the Secretary in accordance with Bye-law 27, be admitted a member of the Corporation; but that the decision of the Council in this case be not considered as constituting a precedent."—Carried.

The Registrar reported that five deaths had been reported to him during the last quarter, viz., Mr Thomas Burton, London; Mr John Brown, Warwick; Mr William Cook, Willesborough; Mr Robert Ousey, Ashton-under-Lyne; and Mr John Ellis, Vice-President, and Member of the Council, Liverpool.

The Registrar also laid on the table a proof of the Addendum and revised list of the Members of the College. On the Report being received, it was moved by Mr Ernes, and seconded by Professor Spooner—"That 500 copies of the Addendum and Revised List be printed, and that they be distributed gratuitously with the Registers now on hand."—Carried.

It was also moved by Mr Wilkinson, and seconded by Mr Secker—"That an advertisement be inserted in the Journals, stating that the Register can be had gratuitously on application to the Secretary."—Carried.

Mr Lawson directed the attention of the Council to the correspondence he had had with Dr Struthers relative to a remunera-



tion for his further services as Secretary to the Scotch Board of Examiners.

A considerable discussion ensued as to the duties of the office, and also with reference to the distance that Dr Struthers now resided from Edinburgh.

It was moved by Mr Ernes, and seconded by Mr Wilkinson—"That the Secretary furnish the Council, at its next meeting, with full particulars of the duties required, and that the question of the appointment and remuneration of a Secretary to the Scotch Board be postponed until then."—Carried.

The subject of the continuation of the allowance to Mr Gabriel was next brought forward, when the Secretary read a letter which had been received from Mrs Gabriel to the effect, that owing to her husband's increased infirmity of body and mind, she regretted being under the necessity of asking for a renewal of the grant so generously conceded to him by the Council in former years, the continuation of which was of the greatest importance to him.

It was moved by Mr Wilkinson, and seconded by Professor Spooner—"That an allowance of L.50 to the late Secretary, Mr E. N. Gabriel, be granted for another year."—Carried.

The Finance Committee reported that they had examined the vouchers and receipts of payments during the preceding quarter, and found them correct. The quarterly balance-sheet of the Treasurer's account showed that the liabilities for the quarter ending October 1st, amounted to L.71, 14s. 8d., which they recommended should be discharged. This would leave a balance in hand of L.598, 18s. 9d. The Committee also drew the attention of the Council to an outstanding account of Mr S. Garrard, the legal adviser of the College.

It was moved by Mr Cartledge, and seconded by Mr Brown—"That the Report of the Finance Committee be received." On this being done, it was then moved by Mr Ernes, and seconded by Mr Helmore—"That it be adopted."—Carried.

It was next moved by Mr Ernes, and seconded by Mr Lawson—"That Mr Garrard be requested to furnish the particulars of his account."—Carried.

It was moved by Mr Ernes, and seconded by Mr Braby—"That an examination of the pupils take place in the week before Christmas."—Carried.

It was moved by Mr Braby, and seconded by Mr Lawson—"That the Treasurer be authorised to issue a cheque for the Examiners' fees."—Carried.

Notice of motion in connection with Bye-law No. 27 was given by Mr Braby, having reference to an increase of the examination fee. It was ordered to be suspended in the Board Room for three months.

At the conclusion of the general business, Mr Lawson ex-

pressed his deep regret at the loss the Council and the profession had sustained by the lamented death of Mr Ellis, and moved—"That a letter of condolence be forwarded from the Council to his widow," which, being seconded by Mr Secker, was carried unanimously.

Cheques were ordered to be drawn for the current expenses.

By order of the Council,

WILLIAM HENRY COATES, *Secretary.*

---

## MEETINGS OF SOCIETIES.

---

### NORTH OF ENGLAND VETERINARY MEDICAL ASSOCIATION.

THE Fourth Quarterly Meeting of this Society was held on Friday 21st October, at Newcastle-on-Tyne, and was tolerably well attended.

Amongst other business which occupied the attention of the members, was the subject of holding meetings, alternately with Newcastle, at Durham, or other towns, as may be decided by a majority of members at the preceding one, a notice of motion to the effect being laid on the table for being finally dealt with at the next meeting. The full importance of such a step on the part of the Society was readily admitted by all present; and it was determined to meet the proposition with all the consideration which it deserves, under the hope that the practitioners of the south part of the county of Durham will come forward and meet their professional brethren of the association, and thus aid in perfecting a great principle so successfully commenced—viz., that of cementing together the whole brotherhood in a common bond of union, good feeling, and desire for advancement.

It was also agreed that, at the general annual meeting to be held on Friday January 20, 1865, when the election of officers for the year takes place, with other business of importance to be transacted, the members will dine together on the occasion, a committee of four members, with the honorary secretary, being deputed to carry out the necessary arrangements.

Mr H. HUNTER, of Newcastle, afterwards read his promised paper on "Navicularthrititis," from which we extract a few points.

Mr H. said—"It does not occur that I have anything novel to advance with regard to this disease; but rather that I am anxious to have it thoroughly ventilated by a free discussion, and statements of the members present. It is only by such means that we can arrive at an approximation of the truth. I believe this disease to be generally prevalent wherever there are hard roads, and horses are required for quick work. Being recently in Antwerp and other continental towns, I was quite astonished at the number of lame horses which I saw—mostly cab-horses—many of them suffering from this disease. It is in this class of horse that navicularthrititis mostly prevails, partly owing to the nature of the work assigned to them, and also to their being condemned to the same after having previously contracted the affection elsewhere.

"The seat of navicularthrititis is the navicular joint—or capsule—which is formed by the perforans tendon as it passes over the os navicularis. The structures entering into its composition, and subject to the changes constituting the disease, are—bone, fibre, cartilage, tendon, ligament, and synovial membrane. It may originate from a variety of causes, all, however, tending to the same result—viz., ulceration of one or more of the structures already named—heredi-



tary predisposition has a great deal to do with its production, less exciting causes being required to complete the development; conformation also may be classed among the predisposing causes—animals with upright pasterns and stumpy low articulations being more liable; fibrous laceration of the tendon in its passage over the bone—forming a more acute angle in such states—is also inevitable; or, the bone itself is bruised, and undergoes the process of inflammation, which, if not relieved, results in ulceration of its cancellated structure, and gradually extends from within outwards, until the dense covering of bone and cartilage becomes involved in the same action. In animals of this formation there is a greater probability of the disease assuming a chronic character, from the peculiar modifications which it gives rise to.

“Although I believe it to occur in animals of the formation alluded to, it is frequently met with in others of quite an opposite form—with good, open flat feet—bulbous frogs; and in flat feet with low weak heels. In such cases I consider it to arise from a direct bruise from below or without, as by suddenly coming down upon a loose stone in progression. Animals that have been kept in a state of inactivity for some time, and afterwards put to severe exertion, are rendered more prone to contract the disease, owing to secretion of synovia being diminished from absence of the stimulus of movement.

“The symptoms indicative of the disease are lameness in one or both fore feet, seldom in both to the same extent. Contraction is only associated with confirmed cases. If the animal be lightly struck with a hammer over the seat of the disease he will wince. He goes on his toes; when standing in the stable points with one or both feet; temperature of the parts variable. In progression he goes best up rising ground, the step being short and quick. The sole becomes concave, foot and pastern more upright, and general action stilty or groggy. The treatment required will depend greatly on the stage. In the primary condition, antiphlogistic measures are called for, bleeding from the foot, hot fomentations and poultices, the sole having been well thinned previously with the drawing knife. Keep the animal quiet, and give cathartic and fever medicine. If the parts are not relieved thereby, apply counter-irritants to the coronets. By adopting these measures, I have frequently succeeded in arresting the progress of the disease.

“In other instances, the disease has continued without the slightest impression being made upon it, in which case I resort to the introduction of a frog-seton as the most likely means of affording relief by bringing our treatment more directly in contact with the parts under the diseased action. I must state, however, even this treatment I have found very uncertain; perfect success gained in one case is no sure guide to the same results, or a valid reason for adoption in a second. If, after all these means have failed, and our patient probably of very little service, we have recourse to the operation of neurotomy, in performing which it is necessary to take into consideration the suitability of the foot to undergo the wear and tear to which it will be subjected afterwards; if it is a good strong foot, there will be comparatively little danger of after ill-consequences, if a thin weak foot, it would be very liable to become bruised, and sloughing take place as a natural result.

“The immediate effects of the operation are instant relief from pain; and as a result, probably ulceration may be arrested, granulations and plastic lymph thrown out, joining the tendon and bone together, thus preventing motion, and causing the animal to go stiffly, a termination probably brought about by the extra weight now imposed.

“If ulceration of the tendon or bone has proceeded to any considerable extent, they are likely to give way under the weight thrown upon them. Sometimes the posterior branch of the nerve below the fetlock alone is divided, thus depriving the foot partially, only, of its sensation, a plan which finds favour with some practitioners.

“In all cases where navicularthrititis is decidedly in existence, I think it very desirable to shoe with leather soles and stopping.



"In concluding these remarks on 'Navicular disease,' I cannot but think that its existence is by no means so frequent as generally supposed; and that pathological conditions of the feet, the nature of which have not been so much investigated, are confounded with it."

The discussion which ensued occupied the whole of two hours, and was ably supported by the President, Mr C. Hunting; Messrs Thompson, Dudgeon, M'Gregor, Hunter, Armatage, and many others; the remarks of the former being worthy of great consideration.

Mr ARMATAGE spoke of the evidences which had come before him, indisputably claiming for the disease hereditary tendencies; but of its frequent occurrence among our hard-worked town-trade cab, harness, and dray horses, &c., that state which had been so confidently asserted as being in these animals navicular disease, he was disposed to deny positively; many cases treated as such, and of course unsuccessfully, thereby stamping the character of incurability and intractability to a disease which has no other evidence of existence but in imagination, if properly examined, their previous history obtained, and the mal-treatment to which the feet have been subjected in shoeing fairly considered and contrasted with the requirements and adaptation of the parts—in a word, physiologically appreciated—would undoubtedly be found to be diseases of the lamina, coffin-bones, &c., with their concomitant effects. The system of shoeing, he felt convinced, worked irrecoverable ruin upon our hard-worked horses; and where exemption from the consequences are fortunately present, it has resulted chiefly from *what has not been done*, rather than from pursuing the system of reducing the feet for the so-called purpose of *preparing* the foot for the shoe—a practice indulged in to the detriment of a large percentage of our town horses in a special degree. It is a practice too common among our horse-shoeing community, and is best known as being the principle of "*breaking a man's head and putting on a plaster afterwards*;" the feet are reduced by that modern invention—the drawing knife—in an unnatural and unwarrantable degree; and again by the nails, both by their form, and manner in which they are being driven, this course being repeatedly carried on without a corresponding reproduction being possible between each shoeing, is compensated for by leather soles and stopping. The foot, properly kept, needs no stopping. The system of "*thumbing*" the sole, as advocated by Mr Miles, is a most absurd practice, and only actuated by entire ignorance of the nature of the parts. Paring the feet of animals to such a degree in these cases of lameness is productive of greater aggravation of the disease, a proper system of shoeing being the best preventive as well as remedial treatment.

Mr D. M'GREGOR much approved of the practice followed and taught by Mr Gamgee, senior, viz., to avoid such paring, but protect the foot by nature's provisions; and agreed with the last speaker in the tenor of what had been said.

Mr THOMPSON believed it to be a safe rule to dress out the feet, both for shoeing and treatment of those cases of lameness, the exceptions to which, however, being those feet with thin, weak, hoofs.

Mr DUDGEON agreed in some measure with Mr Thompson, and advocated the use of stopping to horses' feet, to prevent their becoming hard, which he considered was a forerunner to disease.

Mr HUNTER very ably replied at the close to the various arguments adduced by the members, and supported the views propounded in his paper. As to the treatment of navicularthrititis, it was generally acknowledged but few good results arose from that mostly adopted and recommended—neurotomy in a majority of cases offering the greatest chances of success, though by no means without great objections to its general adoption. Frog-setons afford but very temporary relief, but are greatly assisted by rest and blisters to the coronet.

The PRESIDENT concluded the discussion by a lengthened consideration of the subject under discussion, and analysis of the statements which had fallen from the speakers, urging his conviction that navicularthrititis was not so prevalent as supposed, and that most of the diseases existing in horses' feet, and confounded



with it, or mistaken for it, arose, and are aggravated by the system of cutting away the feet as described by previous speakers,—states being produced which proved as intractable as they were aggravated.

A very interesting specimen of horny tumours in the hind foot was exhibited by Mr Armatage, which went far to illustrate his ideas entertained upon foot diseases; and created an animated discussion upon the nature of such occurrences. There were also exhibited a folding pocket-balling-iron, a contrivance for putting a triangular point to pins used for sutures, and a pocket-balling-probang for foals, all having for their recommendation simplicity, portability, and effectiveness, for the several purposes for which they were intended.

A vote of thanks to the Essayist and President, respectively, being proposed and carried unanimously, brought the proceedings to a close, each member appearing highly satisfied with the subject and discussion brought forward.

Mr Armatage will read a paper at next meeting.

---

### BANQUET OF THE PRESIDENT OF THE ROYAL COLLEGE OF VETERINARY SURGEONS AT BIRMINGHAM.

THE President of this Corporation, Mr R. L. Hunt, invited a large number of its members to a banquet, at the Plough and Harrow Hotel, Edgbaston, on the 28th instant. Amongst those who attended were Mr William Field, London, late President of the Royal College; Mr J. Sampson Gamgee, surgeon to the Queen's Hospital, Birmingham; Mr Lawson, Manchester, and Mr Cartledge, Sheffield, members of the Board of Examiners for Scotland, and of the Council; Mr Greaves, Manchester, President of the Lancashire Veterinary Medical Society, and member of the Executive Council; Mr Charles Hunting, Durham, and Mr E. C. Dray, Leeds, respectively Presidents of the Veterinary Medical Associations of the North of England and of Yorkshire; Mr Walters, Mr J. Marston Parker, Mr E. Stanley, Mr Davy, and Mr Tailby, Birmingham; Mr Blakeway, Stourbridge; Mr Harbor, Kidderminster; Mr Perrins, Worcester; Mr Rose, Warwick; Mr Elkington, Coventry; Mr Huntriss, Dudley; Mr Cartwright, Wolverhampton; Mr Woodger, London; Mr Litt, Shrewsbury; Mr Carless, Stafford; Mr J. C. Broad, and Mr J. B. Henderson, London; Mr T. D. Broad, Bath; and Mr Leech, Bakewell. The loyal toasts having been duly honoured, the President proposed "The Royal College of Veterinary Surgeons." In doing so he observed, that he quoted the corporate title in its widest and most correct sense. He doubted if all the members who honoured him with their presence, much more the general body of the profession, formed a just estimate of what was implied by the legal designation of the Veterinary Medical and Surgical body, incorporated in the seventh year of our most gracious Sovereign's Reign. Many imagined that the Royal College of Veterinary Surgeons was merely the institution in Red Lion Square, London, where the Executive of the profession regularly transacted business, and the annual meetings were held; whereas that was only the official headquarters of the body corporate. The Royal College of Veterinary Surgeons consisted of the entire profession, as by law established throughout Her Majesty's dominions. The Charter of Incorporation gave to each member admitted into their body, after test of his education and proficiency by the Board of Examiners, full and equal share in the electing of the council, and in the custody and furtherance of the general interest. Lest his memory should betray him, the Chairman begged permission to quote, in support of his interpretation, the exact words of the charter, which declares, that "all persons as respectively now are, and may hereafter become, students of the Royal Veterinary College of London, or of the Veterinary College of Edinburgh, or of such other veterinary college, corporate or incorporate, as now is, or hereafter shall be, established for the purposes of education in veterinary surgery, whether in London or elsewhere



in our United Kingdom, and which we or our royal successors shall, under our or their sign-manual, authorise in that behalf, and shall pass such examination as may be required by the orders, rules, and by-laws, which shall be framed and confirmed pursuant to these presents, shall, by virtue of these presents, be *'members of, and form one body politic and corporate, by the name of the Royal College of Veterinary Surgeons.'*" After granting privileges relating to succession, the common seal, the power of legal representation and purchase and sale of property, the charter proceeds to enact, that the veterinary art, as practised by the members of the said body politic and corporate, shall henceforward be recognised as a profession; and further, that the Royal College of Veterinary Surgeons shall "act and do in all things relating to the said body politic and corporate, as fully and effectually to all intents, effects, construction, and purposes whatsoever, as any other of our liege subjects, *or any other body politic and corporate* in our United Kingdom of Great Britain and Ireland." The President contended, that by these and the other very wise and liberal stipulations of the Royal Charter, the veterinary profession were put in possession of that which for many years had been, and still was, the undisguised want of the medical profession—a deed of incorporation with equal constitutional powers and representative faculty to members. He trusted that he might be excused suggesting, that if every legally qualified veterinary surgeon would study the charter, and form an independent and sound opinion of the advantages it conferred upon him, their annual meeting in May would be more numerously attended than was generally the case, and that they would be strengthened whenever they had to seek extended privileges from the State, by the conviction that they had duly valued and put to use those they now enjoyed. It was perfectly true, that the first thought of every member of a society should be the discharge of duty in the particular sphere in which he is placed; but it is equally true, that no amount of industry and ability displayed by individual labourers in their own interest, exempted them from the obligation of doing something in their corporate capacity for the general benefit of their brethren. In the position in which the members of their council were pleased to place him, he felt very weightily the responsibilities attaching to the honourable office of President, which, he never for a moment forgot, was the highest open to any member of their body; in fact it was the highest dignity to which any of them could aspire; for what honour could equal that conferred on a man by his most competent judges—his fellow-labourers in the same calling? At the same time he admitted, and he desired to do so most cordially and gratefully, that his task had been greatly facilitated by the example of preceding presidents; one of the most distinguished of whom had been good enough to honour him, and to favour the meeting, with his company that evening. Mr Field's family had been first in their ranks from the earliest days of the London Veterinary College; and they all remembered how, in the many corporate offices he had filled,—as member of Council and of the Board of Examiners, as vice-president and president,—Mr William Field had invariably given them the full benefit of his learning, of his great experience, and of his high social position. That gentleman's presidential year would ever be memorable in the annals of our body, for the presence of royalty at the annual banquet at the Freemasons' Hall in the metropolis. No doubt the Duke of Cambridge, in graciously coming amongst us, was actuated to some extent by his estimate of the importance of our profession, more especially in connection with the artillery and cavalry of the great army so ably commanded by the Royal Duke; but it cannot be doubted, that the chief cause of the visit of the Duke of Cambridge was his desire to testify the high esteem in which he held the president, Mr William Field. A scarcely less memorable event in the same year, was the conversazione in Red Lion Square, where Mr Field assembled to meet us a large number of the most famous in the Sciences, Lettres, and the Arts. He (the Chairman) could not hope entirely to follow, much less to rival, such an example, but he had done his best; and not his least desire was,



whilst endeavouring to worthily fill the presidential chair, to promote the social intercourse of his brethren, in a manner deserving their unquestionable merits. He had much pleasure in proposing "The Royal College of Veterinary Surgeons, and Mr William Field."

Mr FIELD, in acknowledging the toast, succinctly referred to those great changes in the profession of which he had been a witness, and gave expression to his confident hopes for the future, provided the members of the Corporation followed his friend, the President, in endeavouring to act up to the spirit of the Charter.

The CHAIRMAN, in proposing the next toast, said that he had to ask them to drink success to the Veterinary Medical Societies of England. Their table that evening was honoured by the presence of the presidents of three of those bodies, and to prove the utility of unions of this kind, he had only to bring to the mind, what no doubt was fresh in the memory of many of them, the remembrance of the parent society that was in existence in their college days, when their indefatigable preceptor, Professor Morton, was its guiding star, and which, no doubt, had done much to provoke the thought of establishing these branches in later days. He (the Chairman) had had the privilege of being present at one of the meetings of the North of England Association at Newcastle-upon-Tyne, and also at Manchester, when Mr Lawson of that town brought before the members of the Lancashire Society his very able paper upon Tetanus; and although the scientific facts elicited upon these occasions were of immense value, still the utility of these meetings extends further, by bringing together in friendly intercourse the members of a district, dispelling the little coolnesses that might otherwise exist, giving opportunities for consultation, business arrangements, and other details, that all tend to cement men together in one common cause. He hoped that a Midland Counties Association might be formed, not that it was needed in this town on the score of unity; for he thought that Birmingham rivalled any town in England for the kindly feeling of its practitioners. At that moment there were no less than six members out of the seven present, and the absentee had by letter expressed his regret at being detained by urgent professional business. He was glad to have the opportunity of expressing his deep sense of gratitude for the uniform consideration that he had always received from the hands of his brother practitioners. He would propose success to the "Veterinary Medical Association of England," and the health of Mr E. C. Dray, of Leeds; Mr Greaves, of Manchester; and Mr Hunting, of South Hilton.

Mr EDWARD COLMAN DRAY said, For the very kind manner in which his health had been proposed as president of the Yorkshire Veterinary Medical Association, he begged to tender his best thanks. The chairman, in wishing continued success to Veterinary Medical Associations, had expatiated in such an able manner on the advantages derivable from these societies, that it was needless for him to add but a few observations. The object of these associations is the advancement of our profession, and he firmly believed the foundation of them is now correctly and permanently laid, and hence will follow the sure and gradual extension of the superstructure. The periodical meeting together of the members of our profession must necessarily be productive of good; there now exists a bond of union which was much required before these associations were established. They have a tendency to check backbiting or ill-natured remarks, and the oftener we meet, we not only become better acquainted with each other, but the constant interchange of opinions, stating the results of our different modes of practice, will inevitably bring not only lore to the mind, but raise our status. He felt certain that the time would come when any one would feel ashamed, if he had to acknowledge that he was not a member of a Veterinary Medical Association. He therefore advised, not only that those who are not members be enrolled, but an extension, or formation of more associations in other counties. The power and support these associations may be able to give the Council of the Royal College of Veterinary Surgeons of England, no one can foresee. As Mr Greaves and Mr Hunting will address you on the same subject, I beg leave, in conclusion,



to state that since I have had the honour of being president of the Yorkshire Association, perfect unanimity and harmony have marked our meetings.

Mr J. SAMPSON GAMGEE, in proposing "the Boards of Examiners of the Royal College of Veterinary Surgeons," expressed regret that neither Professor Gamgee, senior, nor Professor John Gamgee, had been able to absent themselves from Edinburgh to share the enjoyment and honour of that evening's entertainment. I cannot but feel (Mr Gamgee continued) that it would most probably have been impossible to propose this toast, but for the action of our president. I do not mean by his invitations to this splendid banquet, but by his influence, first, as an independent member of the body corporate, and subsequently as a member of council, in securing scope for the operation of the Scotch as well as the English Board of Examiners. The Northern Board, be it remembered, had practically ceased to exercise its high functions for some years before the annual meeting of 1858, when Mr R. L. Hunt asserted, and maintained, the right of every member to discuss the Report of the Council. The feeling which our president then initiated, soon resulted in the emancipation of veterinary education, from fetters which had all but fatally paralysed the corporate life by Royal Charter given to the veterinary profession. I make this allusion solely as a matter of historical interest, for nothing is further from my intention than to revive the memory of struggles happily past. I, for one, feel that great and ennobling as is the pleasure experienced in contention for great principles, it must yield to the enjoyment of a spirit of conciliation once the battle is over, and the object won. Nevertheless, dispassionately and impartially do the events of history require to be called to mind for present instruction and future guidance, and it is because the period and events to which I am now referring are full of interest to the body corporate, of which, in common with yourselves, I have the honour of being a member, that I trace this retrospect, and take a glance at its causes and probable results. So long as the Royal College of Veterinary Surgeons obtained its candidates for membership from two schools, of which one headed a schism of the young profession, and the other pursued a scarcely less disastrous plan of action, our Council was under such coercion, that independent action was out of the question. That anomalous state of things ceased, once and for all, with the incorporation of the New Veterinary College of Edinburgh; for by that Royal Act the monopoly of the schools was destroyed. You will, I am sure, gentlemen, pardon me referring to the course adopted by my brother, Professor John Gamgee, at the critical period to which I am alluding. With the example before him of the old schools, and examining their policy to the profession, he felt that it was high time a new path should be struck out. The difficulties seemed insurmountable, and the temptation to avoid some of them was great; but he never swerved from the straight course in endeavouring to advance veterinary education, and to consolidate and foster the corporate interests of the profession. How far these objects have been attained, it is not for me to judge, but the words of the toast, and the presence amongst us of two distinguished members of the Scotch Board of Examiners, remind me that, at any rate, with the incorporation of the New Veterinary College the great object was gained of establishing our corporate profession on the sound basis of a plurality of schools, awakened to the pressing necessity of self-preservation by the healthy stimulus of unrestricted competition. Nevertheless, it cannot be doubted that some, at least, of the professors continued to cherish the idea that the charter gives no power to the Royal College of Veterinary Surgeons to interfere with veterinary education; this is certainly true in the sense that the President and Council have no right of interference within the precincts of the existing schools, but it is equally true that our Boards of Examiners are unfettered in the exercise of their discretion, as to the standard of competency to qualify for admission to membership, and as to the process by which it is to be tested. I am of opinion that when this latitude of examining power shall be duly understood, your Council and their specially appointed examining officers, will principally stimulate veterinary



education, and increase the activity of rival schools to fit their pupils for the standard appointed by the constitutional representatives of the profession. When it is desired to improve a breed of animals, or an agricultural operation, exhibitions are organised, prizes offered, and judges appointed to award them. Reliance is placed on the spirit of rivalry, and on the ambition to excel implanted in the human breast, and the result in practice amply supports the proposition, that if a reward or distinction be offered for an improved article, efforts will be made to produce it, in direct proportion with the magnitude and importance of the prize offered. The work must necessarily be of slow development, but provided the examinations were so framed as to elicit knowledge of the right kind, I have no doubt that in a very few years the effect in the schools would be most perceptible. Much as it is to be desired that the more essentially scientific part of the educational course be better cultivated, great care must be taken not to neglect these useful, and mistakenly termed humbler branches, without which the stock of professional knowledge cannot be complete. By all means let a candidate for the diploma be versed—the more profoundly the better—in anatomy, physiology, and the allied sciences, but very good care must be taken that he is soundly informed on such great and fundamental subjects as lameness in horses, and the domestic management of cattle in health and disease. The laudable desire to raise the profession, and to be esteemed gentlemen, has, I fear, misled some well-intentioned but narrow-minded persons, who have taught young men, that by taking off their coats and soiling their hands, they would lower their dignity. Such men have mistaken their vocation. As a surgeon, I deem myself bound to do everything, for even the poorest of my hospital patients, that can contribute to the cure of disease or to the relief of pain. What more ennobling, after aspiring to the comprehension of nature's highest truths, than to practise the great teaching of nature in all her works—completeness in every detail—neglect of nothing, however seemingly trivial, that can contribute to the attainment of the end in view. It is this knowledge of detail and thoroughness in practice, as well as acquirement in learning, that it is to be hoped the Boards of Examiners may be instructed by our Council to test more and more fully, and to stimulate the cultivation of. Happily we may be quite confident that in whatever measure the Boards of Examiners of the Royal College of Veterinary Surgeons for England and Scotland can help the progress of veterinary education and of our corporate interests, they will never be found wanting, so long as they are composed of such distinguished men as those who now form part of them. Mr President and gentlemen, I have much pleasure in proposing "The Boards of Examiners," and to couple with it the name of my friend Mr Lawson.

MR LAWSON, on rising, said—I regret that you have not coupled the name of my friend on my right, Mr Cartledge, with the health of the Court of Examiners, as I am sure he would have been able to respond to it much more efficiently than myself. This is more particularly necessary on the present occasion, after the very eloquent and discursive manner in which the toast has been proposed by Mr Gamgee. I certainly am of opinion with Mr Gamgee, that the progress of our profession in a great measure, if not entirely, depends on the degree of education and general intelligence existing among its members; and that the united efforts of the various schools, together with those of the Council and the Boards of Examiners, are more than ever necessary to achieve and maintain this most desirable result. Reference has been made to the relations existing between the examining boards, the council, and the schools. Now I think these are pretty well defined. The duties of the Examiners are simply those calculated to elicit the amount of professional knowledge which it is expected a student ought to possess, to qualify him to practise the veterinary art successfully, and to see that the public, as well as the profession, is protected against the mischievous results that would ensue, were improperly educated men allowed to practise, with the authority of the Royal College of Veterinary Surgeons. It is indeed a source of much regret, that the curriculum of study



at present enforced at our schools should be so limited, as to prevent the examining boards looking for more practical knowledge from the candidates who present themselves before it; but I trust the day is not far distant when a more enlightened era will be inaugurated, by the introduction of a more thoroughly practical and extended course of study. I am sure my fellow-Examiners will coincide with me as to the urgent desirability of this step, for nothing strikes us more forcibly at these examinations, than the need there is for improvement in those branches of knowledge which are essentially of a practical character. Let it not be understood for a moment that I wish to detract from the value of those more scientific studies on which our profession is based. On the contrary, I think their value cannot be underrated; but, at the same time, theory must be judiciously combined with practice, science with utility, and the functions of the brain with the use of the hands. Therefore, gentlemen, in returning you my most sincere thanks, and those of my coadjutors in the courts of examination, let me assure you that the welfare of the profession is ever before us, when we assume the responsible functions with which we have the honour to be invested; and if any proof of this was necessary, I need only point to the sacrifice of time we can so ill afford to spare when fulfilling those important duties.

Mr EDWARD COLMAN DRAY, on rising, remarked that the toast that had been intrusted to him deserved more eloquence than he possessed, and he also begged to state that he was unaware, on entering that room, that he should have either to propose or respond to a toast; *ergo*, this circumstance must be his apology for the few very crude and disconnected remarks that he had to offer. He certainly could not help feeling highly flattered by having the honour of what may certainly be considered the toast of the evening intrusted to his care. He was sure the language of Cicero or Demosthenes could not do justice in expressing how much we are indebted to our worthy president, and the council, for their indefatigable exertions in the cause of our profession; their sacrifice of time and money demand our best thanks and gratitude. The council did honour to themselves when they elected Mr Hunt as their president; they must all coincide with him that they could not have chosen a gentleman better qualified to fulfil the duties; he not only possesses the *suaviter in modo*, but the *fortiter in re*. He felt certain that the interests of the profession will progress under his judicious management; words are inadequate to express his high opinion of his capabilities. The *recherche* entertainment presented by the excellent president to them this evening must be felt by all as a most graceful compliment, which he was sure was highly appreciated. The kind and hospitable manner in which he has treated his friends this night will make it long remembered. They had had proof this evening of the combination of his qualities in a social as well as a professional view—his ability to preside over a feast of reason or a flow of soul; and he trusted they would join him heartily in wishing long life, happiness, and success to our President, and the Council of the Royal College of Veterinary Surgeons.

Mr HUNT replied that he deeply felt the kind words and earnest manner of his friend Mr Dray, but was sorry to say that he had greatly overrated his powers and his merits. In the course of his speech he had alluded to the compliment paid to them by the invitation that evening. He (Mr Hunt) begged them to believe that the compliment was on their side, not his. When he looked round that table, and saw visitors who travelled hundreds of miles to be present on that occasion, he might well feel proud to think that he had such a claim upon them as to induce gentlemen, all of whom were actively engaged in professional pursuits, to, at great loss of time, personal inconvenience and expense, throw aside all these considerations, and honour him with their company. There needed no further evidence than this of the value of continuing these social gatherings so worthily commenced by Mr Field, as alluded to at a previous period this evening. He (Mr Hunt) was not egotistical enough to look upon this as a personal compliment; it was one paid to the office that he had the honour to hold. It needed no blandishments of his (so flatteringly portrayed by Mr Dray)



to make these meetings popular, and he was selfish enough to wish that occasions of this kind were more frequent in the profession than they were. From the kind words expressed, and from the look of his friends around, he was induced to believe that no man would leave that room with a worse opinion of his neighbour than when he entered it, and that acquaintances had been made, and friendships formed, that he hoped would be limited only by their lives. Before sitting down, he would again harp upon that string that he always touched when an opportunity occurred; and if they really respected the presidential chair and the Council as much as the hearty reception of the toast implied, pray, let them show it in other ways—support the Council more numerous at the annual meetings in May, and have a voice in sending to that body men who will do their duty in that assembly, and honour the profession. He begged to thank them sincerely for the Council and himself.

The concluding toasts were “The Metropolitan Practitioners and Mr Field,” proposed by Mr Cartledge, responded to by Mr William Field. “The Provincial Practitioners and Mr Stanley of Birmingham, and Mr Broad of Bath,” spoken to by Mr Field, and acknowledged by Mr Broad and Mr Stanley. “The Vice-Chairman,” by Mr J. C. Broad, with reply from Mr J. Sampson Gamgee. The ordinary business was most fittingly brought to a close in an admirable little speech from Mr J. B. Henderson, under whose care the President had placed “The Ladies.”

It was generally admitted that the entertainment was a distinguished success. Of its splendid liberality, we have heard but one opinion, and it is to be hoped the example of Mr Field and Mr Hunt may not be lost on future Presidents.

---

## PERISCOPE.

---

### REPORT OF CATTLE DISEASE IN INDIA.

(*From Proceedings of the Madras Government, Revenue Department, 27th October 1863.*)

Read the following Proceedings of the Board of Revenue, dated 24th September 1863, No. 6084 :—

Read the following Letter from J. I. MINCHIN, Esq., Collector of Kurnool, to W. HUDLESTON, Esq., Secretary to the Board of Revenue, dated 16th July 1863. No. 107 :—

SIR,—1. I have the honour to forward for the consideration of the Board the accompanying communication from Captain Nelson on the subject of the Cattle Murrain, which is at present raging in his neighbourhood.

2. There is no doubt that this disease is the cause of enormous losses to the agriculturists throughout the Presidency, and, by checking the growth of stock, must prevent that extension of cultivation which, under the present agricultural condition of the country, is checked solely by the want of stock and population.

3. Under these circumstances the importance of the question to the Government interests cannot be overrated.

4. The disease has on previous occasions been the subject of report, and is, I believe, acknowledged to be to animals what the smallpox is to man.

5. Amongst cattle it is highly infectious and contagious, but I have not heard of its being either between cattle and human beings.

6. I am unaware of the exact measures alluded to by Captain Nelson as carried out by the Home Government during the ravages of the late murrain amongst sheep in England. It is clear that all such measures as he describes could not be carried out without legal enactment, and even then might not be safe in this country.

7. If, however, inoculation were to prove of any use as a preventive, the advantages attending it would be incalculable, and the experiment should at least be tried.

8. The services of the Government vaccinators might be made useful in this way, and perhaps the people may be more willing to subject their cattle, than their own persons, to the operation.

9. I trust, however, that the subject may be taken into serious consideration, and that the opinion of those experienced in the diseases of cattle be obtained.

10. The annual loss to the wealth of the country by this disease must be very considerable, and I think that Captain Nelson has done good service in endeavouring to draw prominent attention to it.

---

ENCLOSURE No. 1.—From Captain T. NELSON, to J. I. MINCHIN, Esq., Collector and Chief Magistrate, Kurnool, dated Ragendrapoorum, 8th July 1863.

SIR,—1. Within the last three months cattle disease has carried off many hundred head of cattle. In this country, however severely a murrain may show itself, nothing is done; the people do nothing, and the Government does nothing. Two years ago, when the flocks of Wilts and Dorsetshire were attacked with smallpox, Government appointed a commission: stringent measures were taken to prevent the disease spreading. No sheep could be removed from the infected district; the tainted were killed and burned, and the rest *inoculated*. The disease disappeared. I humbly submit that something ought to be done here. The disease in question, which is now reducing the herds by *half*, shows itself first in a refusal of food, the ears droop, the eyes run water, purging commences, which in a few days becomes a bloody flux, and the whole body is covered with large pustules; the animal generally dies between the fifth and tenth days when with a piece of cloth you may sweep the body completely free of hair and cuticle; it comes off as if it had been scalded.

2. I should propose *inoculation* as an experiment. Hitherto there has been kept up an extensive Government cattle-breeding farm in Mysore; might not the people attached to that establishment and to the gun bullocks know something more of these cattle diseases than the poor Carpoo owner of a few pairs? Might not an intelligent farrier or two be spared for a month to inoculate, as I have proposed?

3. Having brought this matter thus prominently to your notice, I am sure you will see the importance of taking steps to check a disease which is the main cause, I believe, of the price of bullocks having risen nearly cent. per cent. in the last eight years.

---

The Board resolved to submit the above papers to Government, with the request that they may be communicated to the Inspector-General Medical Department, and to the Commissary-General for the submission of their views on the subject, and that any information on the records of those Departments bearing on the question may be communicated to the Board. Any public papers connected with the Government measure in England to which Captain Nelson alludes might with advantage be obtained from the Secretary of State. The Board do not feel that the matter is yet ripe for action; but the importance of the subject in a country where agriculture holds so important a position cannot be questioned. The Board have drawn the attention of all Collectors to the serious diminution in stock which was brought to light by the last quinquennial returns, and have requested them to inquire into the causes, and to report on the remedial measures that they would suggest. Drought and disease have wrought great havoc among cattle in the last few years, and it may be feared that in some localities the progress of agricultural operations may be actually impeded to a severe extent, if means cannot be devised for checking the destruction. The connection between epidemic diseases in man and beast is deserving of careful



consideration, and the Board submit for the consideration of Government, whether the attention of the medical department throughout the Presidency might not be advantageously called to the general subject of cattle disease. In conjunction with the Revenue and Commissariat Officers, they might institute themselves local committees to collect and digest facts, and to consider and propose remedies, when some good can scarcely fail to result from their inquiries.

---

Read the following Letter from Colonel JOHN HILL, Commissary-General, to J. D. SIM, Esq., Secretary to Government, Revenue Department, Fort St George, dated Madras, 31st October 1863. No. 205 :—

1. I have the honour to acknowledge the receipt of the order of Government, No. 1931, dated 27th October 1863.

2. The officer at Hoonsoor has been requested to furnish such information as he can afford, regarding the disease now prevalling with such fatal effect among the horned cattle in the Kurnool District, which information shall be transmittted to you as soon as received.

3. In the meantime I may mention that Major Loudon, who was for many years at Hoonsoor, states that the disease appears to be a form of that known by the public cattle attendants as the Burra Azar, or Murrain, and I herewith forward reports<sup>1</sup> describing the outbreaks among public cattle, of a disorder somewhat similar to that brought to notice by Captain Nelson, and the remedies used on these occasions.

4. The diseased parts should be thoroughly cleansed two or three times a day with alum water, and a solution of sugar of lead applied, after which camphorated oil to keep off the flies. The animal should have drenches of raggy flour and onions boiled to the consistency of gruel, given three or four times a day.

5. Dr Gilchrist recommends bleeding. Firing the animal on the top of the neck on both sides, and fomentations of the usual native kind over the whole body, together with warm drenches according to the nature of the disease.

6. Every means should be used to prevent the spread of the disease; healthy cattle should, if possible, be moved from the neighbourhood of infected localities; this proved particularly successful in Mysore, when the Amrut Mahal was in existence, and in seasons of sickness, when the casualties among private cattle which were not moved were counted by thousands, the Government herds very frequently escaped unscathed.

7. If Government move in the matter, it should look chiefly to prevent the spread of the disease. In view to this, the outbreak and site of the disease should be made as public as possible. Cattle owners should be warned to avoid as much as possible the infected districts.

8. Where the disease has shown itself, change of food should be recommended, and likewise a change of place, if possible.

9. In most cases of recovery, the animal will be found useless for months, if not for life; the old saying that "prevention is better than cure," is therefore, in this instance, particularly applicable.

---

Extract from a Letter from Captain HENRY HARVEY, Assistant Commissary-General, to the Commissary-General, dated Seringapatam, 19th August 1811.

2. "The cattle in reserve having been moved from their usual stations, and separated into small portions, were distributed amongst those pastures in the

---

<sup>1</sup> Letter from Captain Harvey to the Commissary-General, 19th August 1811. Copy of a letter from Lieut. Cubbon to Captain Harvey, 25th August 1811. Letter from Captain Harvey to the Commissary-General, 30th August 1811. Letter from Captain Harvey to the Commissary-General, 15th October 1811. Letter from Lieut. Loudon to the Commissary-General, 15th November 1852.

vicinity which appeared to promise most favourably; and the detachments which returned from command were retained at some distance on this side of the farm, and no communication was permitted with the parties before grazing there.

3. “The result of these arrangements, I am happy to say, has been tolerably successful. The disease has evidently abated amongst those portions which might be considered to have been exposed to the infection; and of those returned from command and kept separated from the rest not one bullock has been attacked. Up to the 15th instant, twenty-nine draft bullocks including calves, three carriage bullocks, and seven forage bullocks, have died. The number of casualties is certainly great, but within those few days they have been decreasing, a less number than before are taken sick, and of those a greater proportion recover. It may therefore be inferred that the severity of the disorder is abating.

4. “I am, however, sorry to remark that some of the detachments which have left this Depot appear to have carried the distemper with them. Five bullocks have died, and thirteen have been left behind sick of the carriage cattle which marched on the 16th ultimo to Bellary. One bullock has died and four are sick of the detachment of nineteen bullocks which marched on the 22d ultimo to Chittledroog, and the party is unable to proceed. Eleven bullocks have died of the party which marched to Nundidroog and Rayacottah on the 26th ultimo, all are said to be affected with the *great* disease. I have not received particular accounts from other detachments, but I apprehend that many casualties may be expected at Bangalore.

5. “The strong, bleak westerly winds which have prevailed for some time, unaccompanied with the fall of rain which is usual at this season of the year, are generally considered, and I think justly so, to be the remote but generating cause of the disorder. The air has now been purified by some smart showers; and a conclusion may be drawn from the facts above stated, that the exciting cause (whatever it might have been) existed before the departure of the detachments above mentioned, and that it has now ceased or abated, as appears to be shown by the cattle in reserve gradually growing better, and those which return from command not being affected at all.

6. “Whether the disorder is contagious or simply epidemic, in what part the animal is originally affected, and what mode of treatment should be adopted for his relief, I have as yet been unable satisfactorily to determine. As the safer mode, however, the malady has been treated as infectious, and the diseased cattle separated from those which are unaffected. The natives have administered those medicines which by them are considered advantageous, although it is evident from the name which they apply to it, and by their mode of treatment, that they are entirely ignorant of both the cause and the seat of the disorder.

7. “I am, however, inclined to think it approaches nearly to the description given of the malignant epidemic fever, which has so frequently ravaged the herds on the Continent of Europe, and which in superstitious times was there then, as it is now by the inhabitants of India, attributed to the wrath of Divinity. Religious ceremonies were performed to appease it, and in the present instance, I have of course indulged similar prejudices of the natives.”

---

Extract from a Letter from Lieutenant M. CUBBON, Sub-Assistant Commissary-General, to Captain H. HARVEY, Assistant Commissary-General, dated Bangalore, 25th August 1811.

3. “The party of cattle that arrived at Bangalore in the latter end of last month did not appear at that time to have brought the disorder which has prevailed at Seringapatam; but some of the bullocks must certainly have been infected, for I am sorry to say the disease has broken out with exceeding violence, and continues to extend, notwithstanding the precautions taken to separate the infected from the sound bullocks on the first appearance of disorder. Out of 67 bullocks that were taken sick, 10 only have recovered, 38 have died,



and 19 are not expected to live. The disorder is considered to be contagious, and the most dangerous to which the cattle are subject. It assumes the appearance of a violent dysentery, extremely rapid in its progress, as a bullock seldom outlives the fifth day, and continues to defy any sort of mussaul. The only medicine from which any benefit has been derived is a cooling mussaul, the chief ingredient of which is opium; but even this has been ineffectual to subdue the disorder, excepting in a very few cases."

---

Extract from a Letter from Captain HENRY HARVEY, Assistant Commissary-General, to the Commissary-General, dated Seringapatam, 30th August 1811.

10. "With regard to the nature of the disorder itself, I cannot form any correct judgment. On dissection every part of the body appears perfectly sound, and I am induced to consider the head as the seat of the disease, although the bowels are afterwards affected. A purulent discharge from the nostrils, eyes, mouth, and ears, excoriating and ulcerating the parts; and a violent diarrhoea, accompanied of course with minor symptoms, are the principal characteristics of the disorder, which I do not think is inflammatory. Many remedies have been tried; and relief is certainly afforded by one mussaul, composed of a variety of leaves and woods, the effect and even the names of which are probably unknown to Europeans."

---

Extract from a Letter from HENRY HARVEY, Assistant Commissary-General, to the Commissary-General, dated Bangalore, 15th October 1811.

2. "I have the greatest satisfaction in acquainting you that the influence of the contagion which lately prevailed amongst the public cattle in Mysore, has nearly, if not entirely, ceased, as well amongst the cattle to the westward as amongst those which were temporarily stationed to the northward of Seringapatam.

3. "Although the air has been purified by a very heavy fall of rain, and the distemper in consequence subsided, I cannot avoid supposing that the greatest benefit has been derived from the mode of treatment latterly adopted; and my opinion has been strengthened in this respect by the judgment of a medical gentlemen, who accidentally paid some attention to this subject on a former occasion.

4. "I have already, in my communications on this subject, described the symptoms, and what I apprehended to be the seat of this disorder. I have yet seen no reason to alter my opinion in this respect; but although the treatment adopted by the natives did not coincide with the theory I had formed, it appeared to me imprudent to reject it altogether, more especially as it did not interfere with the system I proposed to pursue.

5. "Their mussauls, therefore, to which they ascribed the effect of cooling the blood, continued to be administered; and I observed they were well calculated to support the strength of the animal, who for many days refuses all kind of sustenance; but being convinced that the disorder was, in the first stages at least, confined to the head, that a purulent and most offensive matter was discharged from the nose, and afterwards from the eyes, mouth, and ears, I resolved to try the effect of injections, with the view of healing the putrid sloughs that might have been formed in the nostrils. A solution of sugar of lead, afterwards of alum, was employed for this purpose, and I am happy to say that the results answered my expectations. The disorder was certainly rendered more mild, the animal sooner recovered his spirits and relished his food, the proportion of casualties was not so great, and I think I may venture to assert the progress of contagion was in a great degree diminished."

From Lieutenant J. LOUDON, Deputy Assistant Commissary-General, to Colonel A. TULLOCH, C.B., Commissary-General, Madras, dated Hoonsoor, 15th November 1852, No. 59.

1. In continuing my report on the Burra Azar, from which the fifth batch of calves of the Training Dépôt is suffering, I have the honour to state, that about the date of my last letter the disease suddenly increased, and continued to do so until the 10th instant, since which no fresh cases have taken place.

2. Twelve casualties have occurred since my last report, and eleven calves remain very sick; I am led from their appearance, however, to hope that the majority of these will recover.

3. The disease, as it has shown itself in the present instance, is known to the servants of this Department by hearsay only, and Dr Gilchrist's Treatise contains no description corresponding with it. It is, I am told, of frequent occurrence among the young stock of the Amrut Mahal, to which it chiefly confines itself.

4. Captain Harvey's account of the Burra Azar, as it appeared in the months of June, July, August, September, and October 1811, entirely coincides with the symptoms of the present disorder. I have accordingly adopted the remedies which he then tried and found beneficial, and their application has been attended with the best results.

5. The disease first shows itself in the eye, and has at first the appearance of the inflammation, which frequently affects that organ in the hot season; on examination, however, the discharge is found to be of a purulent nature, and that a similar foetid fluid is commencing to run from the nose and mouth, causing extensive ulceration, and emitting a most offensive smell, the flies attracted by this speedily deposit their ova on the diseased parts, but more especially about the eye, which, if not treated in time, is completely eaten out.

6. The disorder seems in its first stages to be confined to the head alone, and if not allayed, extends after three or four days to the stomach and bowels, as after that time the chief symptom of the murrain ensues—viz., violent diarrhoea.

7. Captain Harvey's treatment, which has proved so successful, consists in frequent injections of a solution of sugar of lead into the nose and ears, and applications of the same to the ulcerated parts of the mouth and eyes after they have been cleansed with alum water, after which, to prevent the flies from depositing their eggs on the diseased parts, camphorated oil is freely applied.

8. The remedies, if applied at the commencement of the disease, are found to stop its progress, the animals soon recover their spirits, and begin to graze, and in a few days the symptoms of disease entirely disappear. The annexed memorandum shows the number of calves seized, the number recovered and under treatment, and the number of casualties since my last report.

#### *Memorandum.*

The number remaining sick as per last report, . . .	2
The number since taken ill, . . . . .	132
	<hr/>
Total,	134
The number recovered, . . . . .	93
Do. under treatment, . . . . .	29
Do. of casualties, . . . . .	12
	<hr/>
	134

Read the following Letter from Lieutenant-Colonel E. E. MILLER, Deputy Commissary-General, to J. D. SIM, Esq., Secretary to Government, Revenue Department, Fort St George, dated 16th November 1863, No. 215:—

With reference to letter from this Office, No. 205, 31st October 1863, and the  
VOL. VI.—No. LV. NOVEMBER, 1864.



3d paragraph of Orders of Government, No. 2030, 11th November 1863, I have the honour, by desire of the Commissary-General, to forward an original letter<sup>1</sup> from Dr Bidie, the medical officer at Hoonsoor. It is hoped that the information it contains may prove useful to the owners of cattle throughout the country.

---

From G BIDIE, Esq., M.D., Assistant-Surgeon, Mysore Grazing Farm, to the Commissary-General, Madras, dated Hoonsoor, 11th November 1863, No. 283.

1. With reference to your letter No. 7578, giving cover to Proceedings of Government, Revenue Department, of 27th October 1863, No. 310, I have the honour to inform you that the disease therein referred to is well known in Western Mysore, where it is called *Doddah Rogah* and Burrah Azar. It is very fatal, often destroying nearly all the stock in a village. Natives have consequently a great dread of it, and on the first alarm of its appearance not only keep their cattle away from, but themselves also avoid visiting the affected village and its grazing grounds. It is both epidemic and infectious.

2. *Causes*.—The primary causes of this terrible malady are quite unknown. It occurs at all seasons of the year, but would appear to be most virulent during the hot season. Fatigue, insufficient food or water, and whatever reduces the vital powers, predispose to an attack.

3. *Symptoms and nature of disease*.—The disease is in its nature a peculiar sort of inflammation, attacking the mucous and serous membranes of the head, chest, or abdomen, the skin subsequently becoming covered with a pustular eruption. The proximate cause of the various phenomena that constitute the disease would appear to be some change in the constituents of the blood. It has no affinity whatever with smallpox, as that disease rarely affects the gastro-enteritic mucous membrane, whereas it rarely escapes in this disease. It is more like *plague* than smallpox. The characteristic symptoms are, drooping cold ears, hair standing on end, frequent weak pulse, running at the eyes and nose, scanty high-coloured urine, and purging, terminating in a bloody flux. As the disease advances the body may become covered with pustules, the disease generally proving fatal in a few days; but when the membranes of the brain are affected the animal may die in a few hours with the symptoms of apoplexy.

4. *Treatment*.—Lowering remedies must be avoided. If the animal be seen at an early stage of the disease, and there be no purging, the following purgative dose may be given:—Castor oil, 8 ounces.

This should be followed by warm fomentations, and the following febrifuge drench given thrice daily:—℞ nitre, half an ounce; camphor, one and a half drachm; opium, ten grains; turmeric, one ounce; mustard, two ounces; ginger, quarter ounce; conjee, one quart.

As the disease advances, arrack in doses of from 2 to 4 ounces may be given once or twice a day, and the following astringent and cordial drench twice daily:—℞ gum acacia, two ounces; black pepper, quarter do.; womum seeds, half do.; arrack, two ounces; conjee, one quart. If there be no head symptoms 10 or 15 grains of opium may be added to the above. When the head is affected, the whole of the neck should be freely fired.

5. With regard to inoculation it would, in my opinion, be a most dangerous measure, as the cases thus induced are just as likely to prove fatal as those originating in the ordinary way, and is certain to give rise to fresh cases, and thus increase, instead of diminishing, the ravages of the disease.

---

From W. HUDLESTON, Esq., Secretary to the Board of Revenue, to all Collectors.

SIR,—The last quinquennial returns have exhibited in the strongest light the

---

<sup>1</sup> To be returned at convenience.

very serious diminution in the agricultural stock of the country, that the prevailing bad seasons and disease of late years have caused.

2. Had the stock not increased in the due proportion, there would have been good grounds for anxiety, but when, as is the case, a positive and large decrease is perceptible at the end of five years, there is no room for doubt that the evil must be most serious, and that the results in an agricultural community may be calamitous beyond present apprehensions, assuming of course that the returns are approximately correct.

3. The Board desire me, therefore, to request that you will give your best attention to the subject, and will suggest the means which it is in your opinion expedient to adopt, in order to encourage cattle-breeding as much as possible, and to facilitate the keeping up of stock.

4. The rules in force in your district for the occupation of land for pasture should receive special attention, and be reported on to the Board, with proposals for emendation if deemed necessary.

5. The rule in force in some districts, of allowing one-fifth of the whole extent of land in a puttah to be held for pasture at one-fourth of the full *Tarum* assessment, might perhaps be made more general with advantage.—I have the honour, &c.,

(Signed) W. HUDLESTON, Secretary.

---

From W. HUDLESTON, Esq., Secretary to the Board of Revenue, to all Collectors.

SIR,—I am directed by the Board of Revenue to request that, in replying to my letter dated 5th August 1863, No. 4879, on the subject of the decrease in agricultural stock, you will be good enough to state whether there has been a marked increase of disease among cattle in your district in the last five or six years; and if so, whether it has been coincident in point of time with marked prevalence of epidemic disease among human beings, or the reverse.

2. You will also please to state the symptoms of the cattle disease as ascertained from the Ryots, the remedies which they employ, and those which you consider may, with probable benefit, be tried.—I have the honour, &c.,

(Signed) W. HUDLESTON, Secretary.

---

Read the following Letter from the Collector of Kurnool, dated 9th December 1863, No. 203, on the subject of Cattle Disease and the decrease in Agricultural Stock:—

1. I have the honour to reply to the circulars dated 5th and 12th August last, Nos. LXI. (Board No. 4879), and LXVI. (Board No. 5046) regarding the breeding and diseases of cattle, and the diminution of stock as shown in the last quinquennial returns.

2. This is not a breeding district: few cows are to be found in the villages, and those only of a poor description, and stock is kept up entirely by purchase from the breeding country to the east of the Nallamallas, the Northern Taluks of Nellore, and what was formerly the Guntoor district.

3. There are no rules in force for the occupation of land for pasture, and there are no pastures except on the hills, upon which a very luxuriant grass springs up after the first rains along the whole Nallamalla range.

4. In the northern table-land of these hills, near the river Kistna, large herds of cattle are in the habit of being grazed from the commencement of the hot season, until forage is available in the plains. These herds are driven up not only from the Kurnool district, but from the neighbouring Taluks of Nellore, and the Kistna.

5. A small fee per head is paid as poollary, and the right to collect this has been always farmed. This farm has been conceded to Captain Nelson on a fixed rate, for the term of years during which he has the renting of the villages of Siddapoor and Biarlooty.



6. The grazing charge is trifling, is paid willingly by the owners of cattle, and though doubtless but a small portion of the collections reaches Captain Nelson, there is nothing in the nature of this farm calling for alteration.

7. Along the whole range of the Nallamallas the grass is equally luxuriant, and suitable for pasturage, as in the northern table-lands, but in no other portions of the range have I seen any cattle sent up to graze, except the buffaloes belonging to the wadders who work the forests.

8. I attribute this fact partly to the steepness of the hill sides, but chiefly to the dislike of the ryots to live upon these hills. The herdsmen in charge of cattle there are certain to suffer from fever; water is scarce; and the result is that cattle are with difficulty supported on dry forage in the plains throughout the year, when there is a luxurious pasturage within their reach.

9. No poollary or grazing tax is charged on any portions of these hills, except the table-lands to the north, but freedom from this tax in no way tempts cattle owners to send their herds anywhere except to their accustomed haunts.

10. I am not of opinion that any alteration is required in the poollary system partially in force in this district, nor do I think that any advantage would follow, allowing a portion of the puttah land to be held on favourable rates for pasture, the sole result of which would be a needless lowering of the land assessment, which does not press with severity on the agricultural classes of this district.

11. I now come to the question of disease amongst cattle, which subject was brought prominently forward by Captain Nelson, and the information thereby elicited in the letters forwarded to me with the Government Orders dated 11th and 18th November 1863, is the best which I have as yet procured.

12. The disease called murrain by Captain Nelson, is named in Teloogoo, Pedda Moosa Rogum, and detailed inquiries concerning it and the usual remedies have been made amongst the Ryots of every Taluk in this district. I regret that the reports of the Tahsildars have elicited nothing satisfactory, or that was not before fully known, and the remedies practised by the Ryots are so utterly empirical, that it would be a waste of time to note them down.

13. The nature of the disease being utterly unknown, the native practice is avowedly founded on no reason, and in general the matter is left to chance, as whether remedies are applied or not, the attack is generally fatal.

14. The symptoms of the disease are very accurately described in the letter written in 1852 by Lieutenant J. Loudon. The injection into the nostrils of a solution of sugar of lead, the remedy there suggested, is simple, and might be tried in conjunction with the medicines recommended by Assistant-Surgeon Bidie, M.D.

15. It is evident, however, that the necessary appliances are not in the hands of the Ryots, and must be provided by the Government. Syringes with the solution of sugar of lead, and the internal medicines made up, should be procurable in every Taluk at such a price as would cover their cost to Government. In case of an outbreak of the disease, the Ryots would greedily purchase any remedies that might be offered, in their confessed utter ignorance of any useful treatment.

16. I cannot find that there has been any marked increase of the disease in late years. An outbreak of more or less severity will generally be found to occur somewhere in every district during the hot months of the year, and if it takes place in a village, it does not necessarily spread beyond its original locality, as the natives are perfectly aware of the contagious nature of the disease, and maintain a strict isolation of the cattle attacked by it.

17. It is when an outbreak occurs on the hills, when vast herds are collected from all parts of the country within a limited grazing ground, that the ravages committed by it are of the most deadly description. On such occasions it is no exaggeration to say, that hundreds of valuable cattle are carried off weekly, large cattle-owners lose their whole herds in a few days, and hitherto literally nothing has been done to attempt to avert the scourge.

18. I fear that at any time it will be difficult to do much to remedy such a



misfortune, and it was an attack of this nature, which died out many months ago, that induced Captain Nelson to endeavour to draw attention to the subject, in hopes that some mode of treatment might be devised efficacious to check such disasters.

19. The danger is caused by the nature of the country, and the long-continued drought of the Indian hot season, where for several months in each year nothing but dry fodder is procurable in the plains for the support of stock. In such a state of things the cattle must be driven to such localities as afford the necessary pasturage, and it is chimerical to suppose that any improvements in the system of agriculture can alter this general law.

20. Scientific agriculture, the cultivation of grasses, and stall feeding during the hot months, may, in the course of years, be introduced to a certain extent, but the great mass of cattle-owners will probably always look to the hill pasturages for the support of their stock during the dry season, and an epidemic amongst the herds thus congregated must always be looked on as a probable danger. The avoidance of contagion, however advisable, is thus almost an impossibility, and no effort should be left untried for the discovery of the best rational treatment.

21. The Government have referred this question to the medical department, and the Civil Surgeon of Kurnool has been directed to investigate the pathology of this disease. At the present time I am glad to say the epidemic is not raging, but were it most violent, it would be impossible for Doctor Kees to leave Kurnool, and his human patients, to make a trip to the Nallamalla pastures, for the purpose of investigating murrain amongst the cattle.

22. A suggestion has been put forward in the public prints which I think most excellent. It is that the Government should depute a veterinary surgeon to the district for this purpose. Such a visit now would be useless, but if the services of such an officer can be spared for three months, from March to May of next year, he would be able by spending those months on the Nallamallas, in the locality where herds are driven for pasturage from all the surrounding districts, to examine the disease minutely, to test the best modes of treatment, and probably to discover some mode of practice that must at least be more efficacious than the present system of leaving a fatal disease to run its course.

23. I strongly recommend that this step may be taken, and need hardly say that I would afford every assistance to such an officer in his task, and arouse the Ryots to an interest in the measure, which, as connected so closely with their agricultural prosperity, they cannot fail to feel.

24. Should the Government be unable to spare the services of a veterinary surgeon, I consider that the medicines and appliances required for the treatment recommended by Major Loudon and Assistant-Surgeon G. Bidie, M.D., should be placed by Government within the Ryots' reach.

---

Read the following letter from ROBERT COLE, Esq., Principal Inspector-General, Medical Department, Fort St George, to the Honourable A. J. ARBUTHNOT, Chief Secretary to Government, Public Department, Fort St George, dated 17th November 1863, No. 260.

1. Referring to proceedings of Government as per margin, I have the honour to report that I have instructed the Civil Surgeon of Kurnool to investigate the causes of the great mortality of the cattle in the district, and to report upon the *post-mortem* appearances of animals which have died of the prevailing epidemic.

2. I have also consulted Veterinary Surgeon T. Prichard on the subject, who is of opinion that the disease is closely allied to the pleuro-pneumonia, or murrain, which has been so destructive of late years to the cattle in Europe.

3. Inoculation has been practised in this disease, using a portion of diseased lung to inoculate the healthy animals, but in the opinion of eminent veterinarians without such success as to warrant its general adoption.

4. On receipt of Dr Kees's report, I will again address Government on the



subject; but in the meantime I would allude to those preventive measures which have been found effectual in staying these epidemics in other countries.

1st, Immediate separation of the diseased from the healthy animals, and careful destruction by fire, or burial, of all bodies dying of the disease.

2d, Attention to cleanliness in cattle sheds, and care as regards the quality of the food and water.

5. These measures, if generally followed, will, I have no doubt, soon be followed by a diminution in the mortality.

6. It should be remembered that whatever may be the nature of the particular epidemic, all epizootics are generally contagious, and that whenever they occur in particular flocks or herds, these should not be allowed to mix with other cattle. So little attention is paid by native agriculturists to the care of their cattle, the herds being allowed to pick up unwholesome food, and to drink unwholesome water, without the slightest restraint, that I am only surprised that the mortality is not greater than it really is.

7. Medical treatment in these diseases has hitherto been singularly unsuccessful. As Colonel Hill remarks, "They may in a great measure be prevented, but they cannot be cured."

Copy of a Letter from the Financial Commissioner for the Punjab, to the Secretary to the Government of the Punjab, No. 753, dated the 20th November 1863.

1. In reply to your docket No. 1021, dated 12th current, with inclosures from the Government of Madras, inquiring whether a murrain amongst cattle, such as is therein described, has ever occurred in this province, and if so, what remedies, if any, have been found effective, I have the honour to refer you to my docket No. 353, dated 16th May 1861, submitting a report by Dr Tuson on a somewhat analogous murrain in Eusafzai, on which your circular No. 11, dated 22d May 1861, was issued to commissioners.

2. The above report was furnished in compliance with book circular of this office No. 2 of 1858, referring to a correspondence previously published in the Punjab Gazette of the 30th January 1858. That correspondence indicates what is indeed well and generally known, that epidemics amongst cattle more or less analogous to that which has shown itself in Kurnool are of frequent occurrence, though, excepting the report of Dr Tuson, I am not aware that any distinct effort to ascertain the character of the disease and its appropriate remedies has been made or reported since the issue of that circular.

3. Captain Nelson speaks of the Kurnool disease as analogous to smallpox, while Dr Tuson states the Eusafzai epidemic to be of a scorbutic character, so that it may be doubted whether the diseases are identical; still it might be appropriate if copies of the documents above referred to were supplied to the Madras Government for their information, and in the meantime I purpose issuing a reprint of the Madras papers, with a circular to commissioners, calling for the submission of any further information of a practical character that may be available on the subject.

From Assistant Commissioner, Eusafzai, to Deputy Commissioner, Peshawur, dated Murdan, 29th April 1861.

1. With reference to the inclosed correspondence on the subject of the murrain lately prevalent among cattle in parts of Eusafzai, I have the honour to inclose in original the medical officer's report after examining a bullock which died from the disease.

2. The animals on being affected are subject to violent purging, and die in four or five days, and recovery seldom if ever takes place.

3. Upwards of 9000 head of cattle are reported to have died in villages in the neighbourhood of Swabai.

From Civil Surgeon, Murdan, to Captain SHORT, Assistant Commissioner,  
dated 17th April 1861.

1. "I made an examination of a bullock that had died of the murrain now rife in Eusafzai amongst the cattle, and offer the following observations.

2. "As far as I could judge, the disease approached closely to the epidemic well known in the Derajat as 'Juna.'<sup>1</sup> The *post-mortem* appearance of the animal under examination presented the same evidences of atrophy and hepatisation of the lungs that I had seen previously in horses that died whilst I was in the 1st Punjab Cavalry. The causes of this disease, I apprehend, are want of green food, an absence of water in the district, and the dry and arid state of the atmosphere; I do not know of any remedy for this formidable scourge, but Colonel Lumsden has advised me that he gave lime juice to a horse labouring under the disease, and with success.

3. "I consider that this is the only scientific and prophylactic treatment, as the affection arises from a scorbutic state of the blood, and would recommend a further trial of the remedy; but the necessary adjuncts, *i. e.*, plenty of water and green food, are, I fear, not obtainable in the present drought and desiccated state of the ground."

---

Financial Commissioner's Office,  
Lahore, 22d January 1858.

No. 254.—MEMORANDUM CIRCULAR No. 9.

The following documents are published, by desire of the Chief Commissioner, for the information and guidance of commissioners and district officers, the latter of whom should issue instructions to their subordinates, to report immediately upon an epidemic amongst the cattle making its appearance; and on receiving such report, should take steps at once for carrying out the suggestions contained in these documents.

(Signed) D. F. M'LEOD, *Financial Commissioner*.

---

Extract paragraph 3 of a Letter, No. 15, dated 13th January 1858, from the Financial Commissioner to the Officiating Secretary to the Chief Commissioner.

"I take the opportunity, also, of annexing, for the information of the Chief Commissioner, a copy of a letter, No. 4183, addressed by me on the 24th ultimo, to the Commissioner of the Trans-Sutlej Division, pointing out the expediency of having the carcasses of animals, dying from murrain, examined by the medical officer, with a view to the ascertainment of the precise seat of the disease, and suggestion of a remedy. The instructions therein contained appear to be equally applicable to all districts in which murrain may occur; and should the Chief Commissioner consider them appropriate, it may perhaps be deemed advisable that corresponding instructions be issued to the medical department."

---

From D. F. M'LEOD, Esq., Financial Commissioner for the Punjab, to Major E. LAKE, Commissioner and Superintendent, Trans-Sutlej States, Lahore, 24th December 1857.

As the disease now prevalent among cattle, in some parts of the Pâlam and Kangra valleys, appears to be of a very obstinate character, and productive of great mortality, while the natives appear unable, in so far as I am aware, to attribute it to any particular cause, and assert that it first visited the district but a few years ago, and now returns each year, or never wholly leaves it, I

---

<sup>1</sup> Surree.



have the honour to suggest, that the Deputy Commissioner of Kangra endeavour to arrange with the civil surgeon for the dissection and careful examination of the internal organs of the animals that may die from it, in a few of the worst and most decided cases, with a view to ascertaining the precise character of the disease, and devising, if possible, a remedy for it, should none be known to have been heretofore discovered.

---

Extract paragraph 2 of a Letter No. 30, dated 21st January 1858, from the Officiating Secretary to the Chief Commissioner, to the Financial Commissioner.

2. "The Chief Commissioner approves of the instructions you have issued to the Commissioner, Trans-Sutlej States, with a view to ascertain the precise nature of the disease so prevalent among cattle in the Kangra district, and he suggests that these instructions should be circulated generally, and published in the 'Gazette.'

(Signed) H. R. LUDLAM, *Superintendent.*"

---

Read the following Letter from S. C. BAYLEY, Esq., Junior Secretary to the Government of Bengal (General), to the Secretary to the Government of Fort St George, dated Fort William, the 3d March 1864, No. 1097:—

1. I am directed by the Lieutenant-Governor of Bengal to acknowledge the receipt of your letter, No. 1932, dated 27th October last, with its enclosures, relative to the cattle murrain at present raging in some parts of the Madras Presidency, and in reply to forward the accompanying copies of reports<sup>1</sup> which have been received from the Divisional Commissioners in the Lower Provinces, and from the Agricultural and Horticultural Society, containing information regarding the nature of the disease prevalent among cattle in the Bengal Presidency.

2. I am to add, that the Lieutenant-Governor will cause further inquiry to be made on the subject, and I am to request that, with the permission of His Excellency the Governor of Madras, you will be so good as to furnish any further information that may be available relating to the disease in that Presidency.

---

EXTRACTS from REPORTS received from the Divisional Commissioners in the Lower Provinces, Bengal, and from the Agricultural and Horticultural Society, containing information regarding the nature of the disease prevalent among Cattle in the Bengal Presidency.

From Major W. AGNEW, Officiating Commissioner of Assam, to the Junior Secretary to the Government of Bengal, No. 4, dated the 19th January 1864.

\*

\*

\*

\*

Lieutenant Gregory says:—"There has been no epidemic amongst cattle in this district since the year 1856, when the mortality was very great. The symptoms appear to have been the same as those described by Captain Nelson,

---

<sup>1</sup> From Officiating Commissioner of Assam, No 4, dated 19th January 1864. From Commissioner of Chittagong, No. 11, dated 20th January 1864. From Commissioner of Burdwan, No. 13, dated 3d February 1864, with enclosure. From Commissioner of Bhaugulpore, No. 48, dated 8th February 1864. From Commissioner of Rajshahye, No. 24Ct., dated 22d February 1864, with enclosure. From Commissioner of Patna, No. 40, dated 27th February 1864, with enclosures. From Secretary, Agricultural and Horticultural Society, dated 1st February 1864, with enclosure.

with the addition of violent thirst, and that the period between the animal being attacked and its death was not so long as described by him; in some cases death ensuing in a few hours, and few survived the third day.

“ Various remedies were tried, but none were efficacious.

“ Domestic animals alone were not attacked, as deer and other wild animals were found dead in the jungle with the same symptoms.”

---

From C. F. MONTRESOR, Esq., Commissioner of Burdwan, to the Junior Secretary to the Government of Bengal, No. 13, dated the 3d February 1864.

\*

\*

\*

\*

*Bancoorah.*—The Magistrate reports, that about four years since the disease was somewhat virulent in the Bancoorah district, but is now comparatively rare.

It is customary with the people of this district likewise to remove the cattle from the rest of the herd as soon as it is infected, and to give “ Mourilla” fish to all other cattle, with a view to prevent infection.

Besides this, a decoction, composed of the ingredients noted,<sup>1</sup> as also a gruel of rice and water, kept standing for a long time, are given to the diseased cattle.

\*

\*

\*

\*

*Burdwan.*—The natives of this place are in the habit of soaking plantains in ghee, and rubbing it on the tongue of the diseased cattle, as also feeding them with warm “ conjee” water. This treatment, together with application of external fomentation, has been found to be beneficial.

*Midnapore.*—In Midnapore the disease is reported to be a very common one, and Mr Terry, the manager of Messrs Watson and Company, who appears to have had much insight into the subject, is of opinion that inoculation, a proper supply of green food, if procurable, and due attention to cleanliness, are the only remedial measures that could be adopted with any success. Mr Terry’s original report is herewith submitted for readier reference.

\*

\*

\*

\*

---

From J. W. TERRY, Esq., Mofussil, General Manager of the Southern Division of Messrs R. WATSON and Company, to A. SMITH, Esq., Officiating Magistrate of Midnapore, dated the 25th January 1864.

The disease of cattle, written about by Captain Nelson, is a very common one in this district; it is called “ bussunt” or “ gooty.” I have myself lost three hundred head of cattle in a season; it is precisely as Captain Nelson states. There is also another bad complaint called “ homsa;” this is a soreness in the mouth and latterly in the foot. With care this yields to treatment. I strongly recommend inoculation, and would willingly try it if Government would order the Government vaccinator to assist. From long experience, I find disease among cattle begins when green food is scarce. If green food was available at the commencement of the attack, the animal would derive much benefit. Cleanliness is never thought about. I have invariably seen the greatest neglect shown to all sick cattle, and this is the chief cause of so many dying. If proper food was given not a fourth would die that do.

---

From A. MONEY, Esq., C.B., Commissioner of Bhaugulpore, to the Junior Secretary to the Government of Bengal, No. 48, dated the 8th February 1864.

*Bhaugulpore and Monghyr.*—In these districts, although cattle often fall a victim to a disease very similar in its nature to that described by Captain Nelson, yet it cannot be said to assume the character of murrain; and inquiry does not show it to be of a very infectious nature.

---

<sup>1</sup> Bark of sal tree, panful tree, rotten root of plantain, all astringents.



Towards Teghra the cattle disease is called "hurna," and the medicine applied is the following:—

"Twelve chittacks of the bark of the gumbhar tree, and five or six twigs of the white oknum, are pounded together, and boiled in four seers of water till the mixture becomes thick. This is given two or three times a-day. For application to the sores, some of the 'gundh pershar luttee' is boiled in five or six seers of water; the mixture is applied warm.

"In Sheikpoorah the disease is called 'dhoorka;' cautery is applied to the sores on the body of the affected animal, and then to heal the burns, vermilion powder (sindoor) and mustard oil are applied. A mixture of pepper, kutchale, and mustard seed oil, are administered to the animal internally.

"In the south of the district, a mixture of onion, chillies, turmeric, and musk is given."

\* \* \* \*

In the district of Porneah the disease is called "agia," and the remedy applied is a plaster made of the ashes of the common agia grass and mustard seed oil. The agia is said to be the common lemon-grass (*Andropogon Schoenanthus*). The disease mainly attacks the cattle which are driven at certain seasons to graze in the jungles of Nepaul. The chief symptom is the peeling off of the skin when touched, especially about the rump and tail.

\* \* \* \*

---

From R. J. SCOTT, Esq., Commissioner of Rajshahye, to the Junior Secretary to the Government of Bengal, No. 24Ct., dated the 22d February 1864.

\* \* \* \*

Cattle murrain or smallpox appears to be prevalent in the districts noted,<sup>1</sup> and to be generally fatal in effects.

The civil surgeon of Maldah gives an interesting report on this subject, which I transcribe in the following paragraph:—

"Murrain has visited this district, more or less severe, periodically commencing in the month of August 'Bhadroo,' and extending up to the end of April, fluctuating in its severity, and carrying off a great many cattle. The disease is very infectious, and may be kept up if the clothing, feeding-troughs, and feeding-places are not well cleansed or destroyed; fresh cattle going over the recently used pasturage grounds soon become affected.

"The disease manifests itself in the refusal of food, fever, urgent thirst, slight asthmatic cough, the ears and head droop, violent purging comes on, pustules break out on the lips, inside of the mouth, and all down the throat; in some the whole body is covered, the tongue is much swollen, covered with sharp points, and the animal rapidly sinks. Most of those that have the pustules well marked externally are said to have a better chance of recovery. The treatment chiefly consists in separating the diseased cattle at once, and putting them on the free use of plantain tree stocks, chopped very fine and small; the heart of the tree is considered the best, also bamboo leaves partially scorched. The pulp of the *Diospyros Embryopteris* is looked upon as an effectual remedy, probably from its containing a very large quantity of tonic acid. Water is on no account given, there being sufficient juice in the plantain stocks to allay thirst, but those who can afford it give butter-milk and dhye and water.

"The natives attribute the cause to severe and sudden transition of weather. But from my own observations the disease comes round regularly, and prevails most when cattle are fed upon grass from lands that have been submerged, and when freely fed in the month of August (Bhadroo), upon fresh-cut paddy straw, universally given by the Ryots without the admixture of any other sorts of grain, and without a moment's thought of the great damage they are doing, producing most likely the incipient stage of the disease, which rapidly spreads,

---

<sup>1</sup> Dinagepore, Moorshedabad, Maldah, Rajshahye, Rungpore.

and afterwards is found so obstinate to control. Nearly all Gowallas are aware that cows fed on fresh-cut paddy straw, 'powalla,' reduces the milk 50 per cent., almost immediately making it thick and ropy.

"It is a well-known fact that the natives of Bengal will not themselves use new Bhadroo chowl if they can possibly avoid it, from its producing on man obstinate aphtha, derangement of the digestive function and alimentary canal, and when thus affected use dhye and butter-milk freely."

\*

\*

\*

\*

---

From G. F. COCKBURN, Esq., Commissioner of Patna, to the Officiating Secretary to the Government of Bengal, No. 40, dated the 27th February 1864.

"The best and most useful plan is that of preventing the spread of the disease; when one is found to suffer she should be separated from the others, and placed in a high dry byre, away from all other cattle, and the herd should be scattered about, and not huddled together at night as is usual. The sufferers should be allowed as much milk to drink as they will, and the most nourishing slops given to support them through the attack: in this way nine-tenths of the herd will be saved."

\*

\*

\*

\*

---

From C. J. JACKSON, Esq., Civil Surgeon, Sarun, to J. J. GREY, Esq., Magistrate and Collector of Sarun, No. 33, dated the 8th February 1864.

\*

\*

\*

\*

There has been latterly a more than usual mortality among sheep and goats in the district from a disease known among the native as "berooa," the symptoms being first a swelling of the glands of the neck, debility, and rapid purging. Staggers, or an analogous disease, has also prevailed, probably due to unhealthy feeding in ground more or less marshy, the rain-fall during the past year having been so excessive; but I have been unable to get information of any such disease as that concerning which inquiry is made.

\*

\*

\*

\*

---

From Captain S. CHALMERS, Deputy Assistant Commissary-General, Dinapore, to Major J. EMERSON, Cantonment Joint Magistrate of Dinapore, No. 451, dated the 8th December 1863.

I have the honour to return, herewith, the copy of correspondence relative to the murrain among cattle stated to be now prevalent in many districts of the Madras Presidency, and to offer you my best thanks for its perusal. It is fortunate indeed that you thought of sending the papers to me, as I am not without some experience on the subject, gleaned from the adjoining districts (in which the disease referred to has been recently very destructive), as also in five or six cases which have occurred within the last six weeks among the government cattle at this station.

2. The symptoms of the disease, styled murrain in the correspondence, are exactly similar to those exhibited in cow-pox (vernacular "gotee"), for which I may, humanly speaking, safely assert that I am in possession of a most effectual remedy, if not indeed an infallible specific. This consists of nothing more than the black salt of the country (karee neemuck), which in grave cases should be administered twice a day in doses of one ounce each. I have found too that its effect is much strengthened by the addition of tartar emetic (given with only one of the daily doses) in the proportion of sixty grains tartar emetic to one ounce karee neemuck.

3. The above are the largest doses that should be given, and only in severe cases. The karee neemuck will be found a most effectual preventative also, and



where one case appears it should be given daily to all the bullocks in the lines or pastures, in doses of from quarter to half ounce.

4. An indigo planter in the Tirhoot district informed me of the above remedy, and stated at the same time that he had lost no less than 40 bullocks out of a herd of 180 by the disease, previously to his employing karee neemuck as a remedy, when not a single subsequent case proved fatal. In like manner, though the cases that have occurred under my notice have been more sporadic in character, and several have proved fatal during my absence, I may confidently state, however, that in no case in which the remedy has been fairly tried by me has it failed in a successful effect.

5. The precautionary measures to be taken against contagion will readily suggest themselves to every intelligent owner of cattle according to circumstance, position, and locality, and I need not therefore, perhaps, offer any remarks thereupon here, but merely state as a warning to the incautious, that one hour's delay in taking them will certainly be attended with the most dangerous results.

*P.S.*—For the following recipe, which may be safely used in milder cases and generally as a useful alterative, I am indebted to a medical officer of great experience of the subject:—Tartar emetic, 20 grains ; ajwine, 2 drams ; calomel, 20 grains ; arsenic, 2 grains.

From A. H. BLECHYNDEN, Esq., Secretary to the Agricultural and Horticultural Society, to S. C. BAYLEY, Esq., Junior Secretary to the Government of Bengal, dated the 1st February 1864.

\*

\*

\*

\*

Mr Grote, the President of the Society, remarks that, "The symptoms described by Captain Nelson are precisely those of a disease which carried off four of my cattle in 1862. The natives called it 'ghooty,' and this year I lost four more of a similar disease ; more than this number were taken ill, but I brought them round by repeated drenches of suttoo and water. The disease appeared to have its course in some five or six days ; the animal's tongue becoming sore and swollen at the roof, it is unable to eat, and sinks. Apparently the natives are aware of no remedy ; the Gwallas told me they never attempted to give any ; they allow their patients to take their chance. The result of my observations this year was to expect recovery if the patient could be supported by liquid food through the crisis of the disease."

"I have shown the Madras letter to Mr Floyd of the Allipore farm, and he considers the ghooty of Bengal to be different from the epidemic therein described."

\*

\*

\*

\*

Mr Caleb Ladd, who has much practical experience of cattle, observes to the following effect:—That about two years ago a disease was prevalent in Calcutta from the effects of which he lost some of his best cows. It was much the same as described in Captain Nelson's letter. Most of his cattle died with it. The only mode of treatment he could think of was to remove the cattle to another house at once, and keep them quite separate from the diseased animals. He requested a veterinary surgeon to examine some of them after death, and to attend on them before, but he could not afford any satisfaction. The surgeon believed it to be a perfect blood disease, and he could not devise any remedy for allaying it ; so the only chance was to remove the healthy from the unhealthy animals, and burn all the old straw and manure about the cow-house, and to burn straw in the house, and the house as well. He then removed the unattacked animals to a new house on the other side of his garden, and the plague was stayed. So he arrived at the conclusion that this was the best way of meeting the disease. The way the disease commenced, was with a dull appearance and downcast look, ears cold, and eyes and nose discharging water very freely for the first day ; on the second they refused all food, and in three or

four days they died, though two lived for five or six days. The animal which the surgeon attended lived six days, but the day before she died she smelt very offensively, so much so that the surgeon could not approach near to her, so he (Mr Ladd) came to the conclusion that it was the black murrain such as appeared in North America at different times, but not to such an extent as in India, until the past two years, during which period there has been a great mortality, for which there appears to be no certain cure that he has heard of. They adopt the plan above recommended, that is, to remove all the stock as soon as one is attacked, and if the disease should follow, then remove to another place, burning all the refuse of each place. If these precautions were strictly adopted in every instance, he thinks the disease would altogether disappear.

\*

\*

\*

\*

---

Minute by Dr J. B. BARRY.

1. I have perused Captain Nelson's paper on the subject of the disease now prevailing among the cattle at Madras. The symptoms prove clearly that the disease is "ghooty," a very different disease from that discussed in Volume viii. from pages 270 to 318, by Dr Long, in his able report on the cattle disease which ravaged Assam in 1853.

2. The "ghooty" is highly infectious and contagious, and spreads rapidly through the herd. There can be no doubt that inoculation (vaccination might be tried as an experiment) would, as suggested by Captain Nelson, be attended with the most beneficial results, particularly if care were taken to confine the infection, to remove the healthy, and destroy the carcasses of the dead.

3. In the way of treatment, I would suggest the use of liquid food, in which was dissolved a couple of drachms of borax in each meal. This medicine has a most soothing action on the mucous surface, and when there is such extensive irritation and ulceration of the intestinal canal, would, I believe, be followed by the best results. This article is to be found in all the bazaars of India, is cheap, and within the reach of all classes.

4. The "murrain" that infested Assam ten years ago was shown most clearly by Dr Long, to be a blood disease produced by malarious agency. It occurred at a time when a severe form of fever and epidemic cholera were decimating the population of the province.

5. Having given much attention to the treatment of malarious diseases as they occur in the human subject, I have been induced of late years to rely almost entirely on the use of arsenic. Cases which would not yield to quinine or bebeerin (in heroic doses) quickly gave way to the action of arsenic. I am in the habit of advising men visiting the Soonderbuns and the eastern districts to take small doses of arsenic during those months when fevers abound; and I am convinced that, when my advice has been followed, they have escaped. For the type of fevers which now ravage Lower Bengal, it is particularly suited in the incipient form of the disease, as well as a prophylactic. Where it has been tried it has quite fulfilled my expectations.

6. Judging from analogy I would suggest in parts of the country where a murrain exists allied to that which assailed the cattle of Assam, that small doses of arsenic, say from one to three grains, three times a day, be administered during the prevalence of the epidemic to all the cattle, as a prophylactic measure. We all know that arsenic is a cheap article, procurable in every bazaar of India, so that the remedy comes within the reach of the poorest person. One rupee worth of the drug would suffice for one hundred cattle.

\*

\*

\*

\*

---

Extract of a Letter from A. SAWERS, Esq., to A. GROTE, Esq., dated Calna,  
16th December 1863.

With reference to your letter of the 11th, and the copies of correspondence



regarding the existence of a murrain among cattle in the Kurnool district of the Madras Presidency, as reported by Captain Nelson, there is no doubt, I think, that the disease is the "ghooty," or smallpox known with us. The symptoms and progress are exactly the same, viz., two or three days' strong fever, with dulness of the eye, and drooping depressure of the head, followed by purging of an aqueous fluid eventuating in blood. On the fourth or fifth day the pustules appear on the body, which, in mild cases, may continue to fifteen days; but, in severe and fatal cases, the progress of the disease is much more rapid, and death takes place in five to eight days.

\* \* \* \*

This year it has been in a mild form, while last year it proved most destructive; but all admit that the disease is always worst in the months of April and May (Choitro and Boisack).

\* \* \* \*

From the commencement of the disease there is an entire loss of appetite, the animal refuses all food, and eventually has a difficulty in swallowing liquids. Cold water should never be given. The system adopted by the natives of my neighbourhood to impart a degree of nourishment, and to moisten the throat, is to soak some ripe plantains in ghee, and rub the same on the tongue.

The disease is, I think, both infectious and contagious, consequently natives deem it unnecessary, on its appearing in a herd of cattle, to remove the diseased animals; but this is, I think, absurd. The disease appeared six weeks ago in a herd of forty-six of my buffaloes; two were attacked. I immediately detached these two, and removed the entire herd from the locality; only one more case occurred.

\* \* \* \*

(To be continued.)

## WHY ANIMALS TO BE EATEN MUST BE KILLED.

It is universally understood that animals which die from disease are not fitted for our markets. It is also understood that when cattle have been overdriven, their meat is notably inferior to that of healthy animals, unless they are permitted to recover their exhausted energies before being slaughtered. Why is this? The first and most natural supposition respecting those which die from disease is that their flesh is tainted; but it has been found that prolonged agony or exhaustion is quite as injurious, though in these cases there is no taint of disease. M. Claude Bernard propounds the following explanation:—In all healthy animals, no matter to what class they belong, or on what food they subsist, he finds a peculiar substance analogous to vegetable starch existing in their tissues, and especially in their liver. This substance, *glycogène* or liver-sugar, is abundant in proportion to the vigour and youth of the animal, and disappears entirely under the prolonged suffering of pain or disease. This disappearance is singularly rapid in fish, and is always observed in the spontaneous death of animals. But when the death is sudden, none of it disappears. In a rabbit, killed after suffering pain for five or six hours, no trace was found of the sugar-forming principle, and its flesh has a marked difference in flavour. The same remark applies to exhausted overdriven animals; their muscles are nearly deficient in *glycogène*, and yield a decidedly larger percentage of water than muscle in normal condition. M. Bernard likewise finds that animals which are suffocated lose more of this sugar-forming substance than similar animals killed in the slaughter-house. To this let us add the fact, that the blood of overdriven animals will not coagulate, or coagulates very slowly and imperfectly, and we shall see good reason for exercising some circumspection over the practices of our meat-markets.—*Animal Scientific Discovery.*

## HEALTHY STABLES.

*(From the Times.)*

IN the annual review of the progress of hygiene presented to the Army Medical Department, by Professor Parkes, of the Army Medical School, and just issued, notice is taken of the recent report on cavalry stables, made after an inquiry into the subject by the Barrack Improvement Commission. The question is entirely solved whether or not the men should be placed over the stables. As regards the men, there was much to be said against this arrangement, but there was something to be urged for it. But the horse's health has turned the scale. The stables cannot be properly ventilated or lighted if the men's rooms are overhead. In some of the cavalry stables examined, the air was so foul that it was matter of surprise how animals could breathe it and retain any measure of health. In the old troop stables at Hounslow, each successive horse, from the corners to the centre, is supplied with air fouled more and more by the other horses. Many animals would perish under the treatment inevitable in the older class of cavalry stables but for two things—their daily exercise in the open air, and a certain habit which their constitutions acquire of resisting air poisoned by continued exposure to their action; but this resisting power of habit can only be trusted to temporarily, and inevitably ends in loss of health and life. If the horse is to be in health and strength, he must have a free diffusion of the atmosphere, including absence of stagnation, abundance of light, good drainage, absence of nuisance, and sufficient space to live in. The inquiry has shown beyond question that the best form of building is a one-storied stable and only two rows of horses, the ventilation to be by the roof, and formed by a louvre 16 inches wide, carried from end to end, and giving four square feet of ventilating outlet for each horse. The stables recommended to be built in future would give each horse 100 feet of superficial, and 1605 cubic feet. A course of air-brick would be carried round at the eaves, giving one square foot of inlet to each horse; an air-brick is introduced, about six inches from the ground, in every two stalls; there is a swing window for every stall, and spaces are left below the doors. In this way, and by attention to surface drainage and roof lighting, it is anticipated that stables will become perfectly healthy. In old stables, ventilating shafts are to be carried up and air-bricks introduced. More window space is to be given.

## DESTRUCTION OF RACING STOCK AT SWACLIFFE PADDOCKS.

*(From the Oxford Times, August 27, 1864.)*

ON Sunday last, about six A.M., a thunder-storm passed over this neighbourhood, and though of short duration, proved very destructive to the valuable racing stud of Mr William Gulliver, of Swacliffe Paddocks. The stock were grazing in a field near the house, when the storm burst over them, and we regret to add that two colts and a filly were killed on the spot by the electric fluid; a brood mare was also so seriously injured, having her fore-leg broken in two places, the sinews of which were cut through as if it had been done with a knife, that it was deemed advisable to kill her at once. The well-known and valuable mare Redemption, a colt out of which was sold a short time since at Stockwell for 710 guineas, had her fore-leg broken, but her present foal, by Nevill, which was grazing near her, escaped without a scar. As soon as Mr Gulliver ascertained the condition of Redemption, he telegraphed to Mr Stanley, veterinary



surgeon, of Leamington, who arrived promptly at the scene of the disaster, set the fractured limb, and rendered other important assistance. It must be a source of gratification to the sporting community at large to hear that the mare is progressing favourably, and well-founded hopes are entertained of her speedy recovery. Sixteen other valuable mares with foals at their feet, by Nevill and Big Ben, escaped uninjured, the whole of which are looking remarkably healthy and well. The loss is estimated at L.2000. A statement which has appeared in a London paper and a provincial contemporary, to the effect that several of the animals are still suffering from partial paralysis and apparent affection of the brain, consequent upon the effects of the lightning, is erroneous, the whole of the remaining horses, with the exception of Redemption, are, to all outward and visible sign, as free from blemish as ever they were.

---

### OBITUARY.

Died recently, Mr ROBERT OUSEY, Ashton-under-Lyne; his diploma bears date May 31, 1843. Also,

Mr THOMAS LOWE BINTON; his diploma is dated March 26, 1838.

# EDINBURGH VETERINARY REVIEW

AND

## Annals of Comparative Pathology.

---

### ORIGINAL COMMUNICATIONS AND CASES.

---

*The Scope and Objects of the Veterinary Profession.* By Professor JOHN GAMGEE, Principal of the New Veterinary College, Edinburgh. Being the Introductory Lecture delivered in the New Veterinary College, on the 2d of November 1864.

GENTLEMEN,—The pleasant task again devolves on me of welcoming those who assemble in this College for a winter session's work. Not a few here are unaware of the amount and nature of that work. Industrious students soon become deeply interested in it, and cannot fail to perceive that whatever may be the present social status of members of our profession as contrasted with that of others, it is impossible to be engaged in studies more interesting and ennobling than those which you will prosecute here. You have full scope to excel as comparative anatomists, physiologists, chemists, and pathologists. All depends on your individual tastes and capabilities as on the length of time and care devoted to your preparation for the practice of an art which, in difficulty and interest, vies with any other of man's callings. The quantity of work before you from the time of leaving this College is as great as any body of professional men need to wish for. It is perhaps more than any of you anticipate; inasmuch as the importance of our profession is only now being appreciated, and the want of a strong body of able veterinarians is just being felt. On a recent occasion a member of Parliament asked "If qualified veterinary surgeons had to be appointed to watch and guard against the spread of plagues in animals, could we get a sufficient number?" This question referred to the United Kingdom alone, and the only reply that could be given was, that the number of practitioners at present would be inadequate for the task. It is fortunate that all intelligent men admit that veterinarians should be engaged for such a purpose; and this admission, made by farmers, cattle-dealers, and scientific men before the committee of the House of Commons which took evidence on the subject of cattle disease prevention last summer, cannot fail to bear good fruits. Indeed, gentlemen, in the colonies, where



people depend entirely on agriculture, and especially on their herds and flocks, there is every disposition to recompense those who can avert such calamities as have recently befallen many of the Australian stock-owners, and young men who not long since sat where you are sitting now, find their services appreciated in a manner which they scarcely could have hoped for. It is true that the higher positions which should have been assigned to veterinarians are often held by non-professional men, but this is entirely due to the want of members of our profession to take the lead. I am aware that some have been wronged, that not only in Australia, but also in India, commissions have been appointed to inquire into the spread of cattle diseases, and farmers and medical men, to the exclusion of veterinarians, have been engaged in the inquiries. This is perhaps our own fault, as we have had few to lead the way in researches which are complex and difficult, and which call for far more knowledge than veterinarians usually possess.

I have on former occasions drawn attention to the fact that the number of young men who enter veterinary colleges from year to year is quite inadequate for the wants of the British empire. I am again tempted to refer to this subject, because I believe that the evil only requires to be known and published in order that many who are undecided as to their future avocation may benefit by the prospects which our profession affords them. I need not enter into details to demonstrate that during the last twenty years the British people, whether at home or in our colonies, have made vast strides in reclaiming land and multiplying stock of all kinds. The amount of live stock at home has not increased much, but the mortality from sickness has been trebled, and perhaps quadrupled. The millions of people who have emigrated since 1844, and who are still on British soil in British dependencies, have contributed to the enormous increase in the number of cattle and sheep, which English veterinarians should have looked after. That they have not done so is well known to all, and instead of the number of practitioners increasing year by year, wherever British capital has opened up new fields for their services, we find that, whereas in 1844 eighty-two young men became members of the Royal College of Veterinary Surgeons, only sixty-eight entered the profession in 1864. It is true that nearly a score more during the present year have taken the Highland Society's certificate, and some might look on these as good as properly qualified men; but even then the increase in graduates would only amount to six. In other words, during the twenty years of active progress in almost every department of human industry, we find the body of British veterinarians lagging behind. It is most singular that the Americans, who have manifested the greatest activity in the promotion of science and the useful arts, have never been able to found a thoroughly efficient veterinary college. They number amongst themselves but few veterinarians, and most of them have been induced to leave Great

Britain. Is it to be wondered at that their cavalry horses have been cut down by disease in a most disastrous manner? Is it to be wondered at that they are now asking how they may remedy an evil which is found to be of far greater importance than they ever before imagined?

Were there not much misconception as to the nature of a course of veterinary education and the duties of a veterinarian, we should have many flocking to our Colleges who now never think of entering them. A young man secures a veterinary diploma at far less cost, and unfortunately in much shorter time, than it takes to learn any trade. Eighteen months' work, and little more than is necessary for mere board and lodging, suffice to make a member of our Royal College. I know some of the wealthiest of English veterinarians who did not spend L.50 from the day they became students to the day they graduated, and this included board and lodging, as well as College and examination fees. The very facility of entering the profession seems to have deterred many from following it; and it is the opinion of some that if we made it more difficult and expensive we should have a better and larger class of students.

A very superficial inquiry into the causes which have checked the development of our profession proves that we have not known how to widen the sphere of our labours. There have been no pioneers to guide the many into the right track for procuring profitable employment. The large cities are crammed with practitioners, whilst important country districts of great extent are still deprived the advantage of well-informed advisers when sickness or accident befalls any domestic quadruped. I have striven for a number of years past to show that hitherto veterinarians have only gained an adequate livelihood by attendance on the horses which are chiefly kept for the pleasure and comfort of the wealthy. It is a well-known fact that we have been ill paid and poorly encouraged to relieve the sufferings of the far larger number of animals employed for the purposes of trade. Agricultural stock suffers serious neglect. I venture to assert that ninety per cent. of the cattle which suffer from disease throughout the United Kingdom annually are never seen by veterinary surgeons. Indeed the ignorance of those who have held foremost positions amongst us on the subject of the amount of disease in the country can only be explained by the fact, that if we do not search for information regarding mortality amongst stock, we are not in the way of gleaning it in daily practice. For instance, in the city of Edinburgh we have a couple of thousand cows; in London there are twelve or fourteen thousand, and so on in proportion in other cities. Disease is raging frightfully without intermission. During fifteen days of the past summer as many as 100 cows were driven sick or dead from the byres of this city, and last week I traced sixteen within the short space of twenty-four hours sold in all stages of pleuro-pneumonia.



In my report to the Privy Council in 1862, I published a table referring to the losses amongst cows in a twelvemonth in the Edinburgh dairies. Inquiries conducted by me with the greatest care resulted in the remarkable revelation that out of 1839 cows kept in 88 dairies, 1075 were sold diseased to butchers. That table, which formed a small part of the statistical information I collected for Government, has this year been attacked by Mr Hall Maxwell, causing the dairymen of this city to assert that the table could not be correct, because they had not furnished me with any information on the subject. It is a remarkable fact that the figures above quoted were only deficient from the entire number of diseased cows not having been traced, and the truth is more fairly represented by asserting that, generally, the dairymen sell within the year as many animals in a state of disease as the number they usually have in their sheds. In fact, a dairyman who keeps 30 cows usually buys between 50 and 60 per annum, owing to the rapid manner in which town stock is destroyed. All the independent inquiries that have been made confirm this truth.

This year I have secured on two occasions from gentlemen, who wished to test the truth of the statistics published, evidence tending to confirm the results I had arrived at. The first I received on my return from London in June last, and referred to ten dairies in this city, in which the losses were as follow :—

Dairy.	No. of cows.	No. sold diseased.
1	30	27
2	25	20
3	35	41
4	30	25
5	6	5
6	11	9
7	9	4
8	40	20
9	35	21
10	26	14
	<hr/> 247	<hr/> 186

The rate per cent. sold diseased within six months in these ten dairies amounts to 75.

Another person who doubted the statements made was so astonished by his visits to the dairies of this city that, after observing an attack on me in a paper that has striven by all means in its power to bolster up the traffic in diseased animals, he favoured me, and that only last week, with the following notes :—

One cowfeeder, visited on the 22d of September, had 31 cows in his byre, and confessed to having sold 6 diseased within a month.

A second, visited on the same day, keeps 4 cows, and he had sold 6 diseased since May.

A third, who keeps 7 cows, has sold 7 diseased and dead since January last.

A fourth, who keeps 6 cows, had sold 18 diseased and dead since last December.

A fifth keeps 8 cows, and has sold 11 diseased since January.

A sixth, with a stock of 20 cows, has sold 40 diseased in the same time.

A seventh keeps 30 cows, and sold 17 diseased during the past summer.

An eighth, visited on the 27th September, and who keeps 6 cows, has sold 12 dead or affected since Whitsunday last.

A ninth, with a stock never exceeding 20 cows, sold 17 diseased in four months.

A tenth, who owns 40 cows, was visited on the 30th September, and stated that he had sold 40 diseased cows since last January.

The eleventh, who keeps 8 cows, visited on the same day, had two suffering from pleuro-pneumonia at the time, and had sold 16 dead or dying since the month of April last.

A twelfth, with 11 cows, had disposed of 5 in a state of disease within a week.

I am prepared at any time to produce ample evidence of the truth of the above statements; and were it not that statistical details are not well suited for the present occasion, I would add more to the facts above set forth.

Truth must prevail in the end, gentlemen, and no better confirmation of all I have said can be obtained than that derived from the state of anxiety and alarm which now exists amongst the dairymen in this city in consequence of our Town Council having appointed an inspector who was chosen on the recommendation of the Edinburgh butchers, and who by condemning the carcasses of diseased cows, threatens to ruin the dairymen of this city. It is true that stopping this sale here will cause them to be sold elsewhere; but why shall we not strive to prevent the extraordinary ravages by pestilence, which we can daily witness if we watch for them? Why shall we not frame measures to protect the dairymen? In their great difficulties they have adopted the only means which could protect them from ruin, viz., by selling their diseased stock; and if we are determined to stop this for the public good, it is hoped that some system to substitute may be devised. I am altogether opposed to the oppression of any class of men, and I am confident that the Dutch plan of insurance based on the prevention of disease, and the medical treatment of any animals which fall sick, will meet the case.

Permit me to ask, What is being done in the way of prevention? Hotbeds of disease require to be dealt with in a special manner. If an outbreak of human cholera or smallpox occurs, we set to work and drain, ventilate, and vaccinate; but as cattle proprietors wish to preserve secrecy, and disregard all measures



of sanitary reform, nothing is done. I was recently advised by a worthy friend not to trouble myself with the cattle-disease question, considering the temper and the feeling of stock-owners on the point. It is needless to remind me of the ill-will I have incurred amongst those who bolster up a vicious and disgusting traffic, and it is equally needless to ask me to desist in my endeavours to supplant a system based on reckless folly and mismanagement by one which must contribute to the good of the country, and especially to the benefit of those who have been most loud and vindictive in their attacks on myself.

If the farmers in this country think that their interests are looked after by those who strive for popularity in asserting that cattle with the foot-and-mouth disease should be allowed to come in from abroad—that animals with any disease should be freely bought and sold, or conveyed by railway—that scabby sheep are too numerous to be inspected, and so on,—all I say is, that the farmers deserve to suffer. I have no pity for them, and I must ask the public at large to refuse to be imposed upon by people who, always ready to impute bad motives to others, are guilty of the transparent expedient of trying to convince the people that they must choose between starvation or buying diseased meat.

If the Highland and Agricultural Society, and some of the farmers' clubs and associations who have opposed legislation for the prevention of cattle disease, are in earnest in attending to the farmers' interests, let them subscribe a sum of money and publish all the reliable statistics that can be placed at their disposal, and let them collect sound information as to the efforts of preventive measures abroad, and then we shall find very different statements will be made to those by which it was endeavoured to hamper Government in its efforts last summer to adopt means for the prevention of cattle and sheep plagues. I assert again, without fear of contradiction, that the insurance statistics I have published from time to time have been thoroughly sound and trustworthy, and I am prepared to contrast them with any body of statistics collected in this or any other country on any medical or veterinary question from time immemorial. I speak advisedly, after having worked at the subject so as to ascertain the truth, the whole truth, and nothing but the truth.

Once more, then, may I be permitted to impress on our students the importance of studying veterinary medicine for the great object of preserving the health of animals. We must aim at this more than at the cure of disease. Stock-owners cannot afford to pay veterinary surgeons' bills whilst they are losing their animals, but they can spare of their plenty when diseases, now so destructive, are banished from their farms.

I look forward with confidence to a not far distant time when these truths, reiterated *ad nauseam* in this Hall, will be admitted throughout the length and breadth of the land, as, indeed, they are

already admitted in our colonies. Veterinary medicine is something more than the art of healing sick animals. It is the art of preserving animals from sickness. To secure this we must be thoroughly conversant with the laws which govern health and disease; and it is very remarkable how safely we grapple with the intricate questions which constantly present themselves in the practice of our very difficult profession, when the understanding is fully developed by a course of sound scientific and experimental training.

The system we adopt in this institution in training veterinarians is that which we believe best adapted to develop a love for independent thought and observation. We condemn the pernicious cramming or grinding system, and strive, so far as practicable with you all to learn, to educate your senses of sight, touch, hearing, and smell, as well as developing your memories. Efforts of memory are not so valuable as efforts of perception. We wish you to remember that a bone has processes, and a muscle attachments, by causing you to feel them, and not by merely asserting that such anatomical peculiarities exist. In matters of science, it is dangerous to trust to that which we hear or read. We must acquire knowledge by personal experience—by that kind of experience that has been wanting amongst the teachers and practitioners of the past. There has been too great a tendency to take all for granted, on the *ipse dixit* of any one capable of loud and dogmatic assertion. It is dangerous for a student in the earlier part of his career to be too sceptical; it is more dangerous for an advanced student to repose too much confidence in others. Learn how to unravel the mysteries of science for yourselves,—how to solve problems by independent calculations. Act in matters of science as you would in money transactions—count the cash though you receive it from the most honest and accurate of accountants. It is certainly undesirable to lack faith in others; but acquiring that lazy habit of trusting any one, and not thinking or working for yourselves, is still more to be deprecated.

When young men first commence their studies, they experience no small difficulty in seeing that which to the trained eye is patent. Any person on first looking at an object under the microscope fails to form a correct idea of the nature of the object seen. Thus, if an animal cell is looked at without previous explanation, no distinct idea is formed of the constituents of that cell. A child looking at two trees acquires a general idea of their form, but does not appreciate the essential points of difference between them. His attention must be drawn to peculiarities by one having the requisite knowledge. We do no more in teaching you anatomy, chemistry, and other sciences. As your period of study here is short, you must for a time take much for granted; but we shall not be satisfied with your progress if you do not acquire the power and desire for independent observations and reasoning. A man may forget



what he has heard, but he cannot fail to remember what he has acquired by personal investigation.

I have a great horror of systems of tuition based on hearsay. I therefore dislike the apprenticeship system in our profession, which is attended with some advantages, but with the great drawback of habituating young men to work by routine—by rule of thumb. A horse has a colic, give him a colic draught; a cow is hidebound, give it a drench. Apprentices become free in their movements, and even confident in their prescriptions, but they never know why they do this or that. They do as their masters tell them, and spend much time and money without learning how to think or act for themselves. When once this system of action without thought is acquired, it is difficult to eradicate; and hence am I in favour of first teaching you how to think for yourselves, and then asking you to do. Every blunder is then a useful lesson, and you can learn by the errors of others. All true experience is purchased at a dear price, and no true experience can be acquired in doing just as you are told without reason or explanation.

The importance of first moulding the mind and developing habits of thought is so great, that a good school education is undoubtedly the best preparation for college life. Most of our students now-a-days are not so seriously deficient in this respect as they were; but there is no doubt that, if other circumstances rendered it desirable, I should not oppose the introduction of preliminary examinations for all students entering veterinary colleges. At present, my objections to such examinations rest on the restrictions placed thereby on the already small body of young men that annually enter our colleges; and I have constantly observed that a few months' training here has made up for vast deficiencies, and those who had not the advantage of such early education have succeeded admirably as veterinary students. The first step in the right direction will be, I believe, the extension of the curriculum of study in veterinary colleges. I consider this now of far greater importance than preliminary examinations; and I am most anxious that veterinary colleges should be compelled to adopt such a course by the profession at large.

Of late veterinary associations have made rapid strides in this country, and much good would result from discussions on veterinary education. In this way, the colleges which now refuse to make any change for the better, might be induced to aid in very many reforms. If the veterinary profession refused to support institutions which are only remarkable for obstinate resistance to measures of improvement, we should soon move onward. The New Veterinary College needs no spur, but on many vital points it cannot act alone. It has already accomplished much, and it is hoped that force of example may have some effect, and that much more may speedily be done.

I anticipate much good from the growing tendency amongst agri-

culturists to acquire a certain amount of veterinary as of other scientific and practical knowledge. In this way we shall, in the course of time, secure a rational public opinion in support of all that is good and useful in the profession. The short-sighted policy of keeping farmers in the dark, that we may find them submissive clients, cannot be too strongly condemned. A few amateur veterinarians may spring up among regular practitioners; but men of sound judgment will always resort to professional men in cases of difficulty. They will, in fact, have a better estimate of their own ignorance and the difficulty of our art, by knowing something about it. They will appreciate services rendered. Human medicine did not flourish much when people were more ignorant than they are now. Family medicine chests and housewives' specifics are only in favour amongst the deluded few who are too stupid or ignorant to know better. Cure-alls abound amongst the superstitious who can neither read nor write. I believe that veterinarians will be much more consulted than they are as our farmers become better informed.

And now, gentlemen, turning to the course of instruction which you have to follow in the ensuing session, I have to urge all who come here for the first time to concentrate their attention and their energies on the study of the elementary sciences. You will have great difficulty in ascending the first steps of your educational career, but we can only learn well by learning slowly. You will find every one ready to aid you in your difficulties, but you must depend mainly on your own endeavours, and we strive to help those most who try to help themselves. It was for the purpose of encouraging junior students to labour hard during their first session at the elementary sciences that we established a prize in this College of greater value than any ever offered to veterinarians. The free studentship competition has operated most beneficially in inducing young men to acquire a large amount of exact knowledge on the sciences of anatomy, physiology, and chemistry. The gentlemen who have competed successfully have held a foremost position amongst our students up to the present time; and I doubt not that the advantages of admirable preliminary preparation for the prosecution of the more advanced scientific studies will be demonstrated by the success of our free students in after life.

A few words may not be out of place as to the manner in which you must work from day to day in order to impress on your minds what you hear and see in the lecture-room. Hard reading is not, in my opinion, the best way to accumulate knowledge. Many of the veterinary works published in this country are such as to lead you far into error, if you trust to their author's facts and theories. We have no sufficient literature to enable you profitably to read on all the subjects we have, as your teachers, to enlarge upon. You will have little difficulty in following in so far as anatomy is concerned. The chemistry text-books are those used in medical



schools, and are doubtless excellent. You would have to wade through many works to get a knowledge of veterinary physiology, and the same may be said with regard to veterinary medicine and surgery, *materia medica*, &c. I hold that a course of systematic reading raises the memory more than the understanding; and by the time you have read a number of closely printed volumes you will find that you have forgotten not a little of their first perusal. A far safer and more certain method of learning is that of preparing your own text-books, that you may learn by writing as well as reading and reference. Some may smile at this recommendation, but any diligent student who takes as copious notes as he can day by day of the lectures he attends, copying and extending them during his evening's work, must learn more than by reading the works of many, especially when that which is taught and that which is read do not confound.

It is impossible for you during the few months you are at College to do more than accumulate information. The amount you will accumulate will be larger by closely following your lectures than by desultory reading, and in due course you will acquire sufficient knowledge to enable you to read even bad books with profit. It is singular how readily knowledge is gathered after a proper foundation has been laid. You learn from the most unexpected and unpromising sources. It is not easy for the first nucleus of an avalanche to form, but as it rolls from an Alpine summit it grows with enormous rapidity, and a handful of snow is soon converted into a rolling mountain which buries a village. It is the same with knowledge. Scarcely a man you speak to, however humble or ignorant, but you can learn something from of direct use to you as professional men; and if I have one recommendation to make of more importance than another, it is that you disregard no means of learning. There has been a growing tendency to disregard in Veterinary Colleges the best means of studying the most important of the diseases of the horse; because to do so you require an intimate acquaintance with the working of the forge. Those who are above any part of this work had better abandon the whole. We do not want kidglove gentlemen—afraid to soil their fingers, but men who consider that culpable ignorance is more dishonourable than physical labour. Strange it is that the highest in the land are always inculcating their views on the value and honour of manual labour; showing that no position of usefulness can be maintained in this world without exertion. And still we find in a profession such as our own men who declare that the connection of our calling with the anvil degrades it, and tends to prevent our rising. What have we done to elevate ourselves? Have we demonstrated our usefulness in unmistakeable terms? It is evident, from what I have said before, that we have not to the extent that we should have done. A proper spirit of inquiry must be fostered, and no obstacles be allowed to interfere with your

fitting yourselves, in the best possible manner, for any work you may afterwards be called upon to perform.

I shall not detain you longer with any general recommendation as to your duties and future conduct. Those who have had charge of your earlier training must have inculcated in you principles which it would be almost too late to acquire at College; and the advice usually given as to perseverance, integrity, and doing unto others as you would they should do unto yourselves, might be repeated by me now, but without enlightening you on any new point. It is my final duty to show you that the profession you are about to enter is an important one,—that the work you have to do, though difficult, is not insurmountable,—that you may expect abundant encouragement if you deserve it; and with these observations I leave you to learn sense for yourselves.

---



*An Address delivered before the Members of the Liverpool Veterinary Medical Association, at their Inauguration. By Mr THOMAS GREAVES, M.R.C.V.S., President of the Lancashire Veterinary Medical Association, November 15, 1864.*

GENTLEMEN,—It is proper that my first remarks should be an expression of the sorrow I feel at the great loss your Association has sustained, and which we all mourn, in the death of your late respected President, Mr Ellis, a gentleman so highly and so deservedly respected, not only here in Liverpool, but in Manchester, and in the Council in London; not only as a man of honour and integrity, but as a man of talent, and a most distinguished ornament of the profession to which he belonged. As my friend Mr Lawson said in the Council Chamber, “The profession has no truer friend than was to be found in Mr Ellis.” Personally I felt proud when apprised that you had done yourselves the honour in electing him your President. Such a selection added a grandeur to the Association, and to the high office he had been so worthily placed in. The honour, the interest, the usefulness, and dignity of the Association would have been in safe keeping in his hands. I know you will gladly and proudly take charge of his fame and revere his memory.

I leave the question of his successor entirely with yourselves; but I may be permitted to remark, it is very desirable that he should be a man whose social and professional position commands respect, a man of kind conciliatory manners, of courteous and gentlemanly bearing, but, above all, sincere, intellectual, indefatigable, earnest—one whose heart and soul is in the cause, and who feels a deep interest in the welfare of his profession. Let it be a sacred principle that this Association shall be carried on in a proper spirit, and that it shall require from its members the observance of an honourable professional conduct. The straightforward conduct of its officers must be such as to infuse an irresistible check upon any who might be disposed to be so unscrupulous as to practice any intriguing, dissembling, or foul play, which, alas! is occasionally such a fruitful source of enmity and heart-burnings, especially in large towns where competition runs high. It is one of the main objects of these associations to keep in check this over-reaching, unprofessional conduct, and to create a purer and higher tone of professional honour. We do not expect to change the nature of man, or to irradiate his evil propensities and his sordid passions, but we seek to keep them within reasonable bounds, so that we shall not go on like so many lads in the street, scrambling for the coppers thrown amongst them. I have perhaps had more to do with provincial veterinary medical associations than any other man has had. I

had the high privilege to call together the first society in England fourteen years ago. That society existed only two years. Of the twelve members of which it was composed, three only remain. That society expired like a smiling babe in its cradle, as if falling asleep, and was dreaming of a glorious future. After a lapse of twelve years I had the high honour to call it again into existence. I can compare that calm and silent repose like unto the powers of a nation for a time laid aside—the sleep of the warrior snatched during the interval of action—a repose but to acquire fresh power and energy—the sleep of a child, but the awakening of the giant. This our present Association is now two years old; it looks like a cedar of Lebanon planted by the river of Jordan; its roots strike deeper and deeper, and its wide-spreading branches shoot up higher and higher; it can now shelter and protect those who reared it. We now meet under the most favourable auspices, and our Association is a firmly established institution, acknowledged and encouraged by the Professors and the Colleges. Each member is animated by a strong desire to advance the usefulness of our noble profession; it encourages a personal goodwill, and we feel, individually, fully conscious of the good fruits of thus associating together (emulation having been excited). The progress we have made encourages us, nay, demands from us, greater efforts and greater intelligence. Every educated person who watches and studies the times in which he lives, and wishes earnestly to further the accomplishment of the mission he has to perform, feels a new stimulus in these associations; for assuredly Providence nowhere creates success or prosperity for an ignorant or inactive individual or nation, for they are most assuredly exerting an influence, it may be imperceptible and unperceived by us at present, but the quiet undercurrent is not the less certain. Depend upon it, the highest interests of the members of our profession are identical (it is a dangerous symptom when man becomes indifferent to the interest of his fellow-man), it is only ignorance and cupidity which prevent their uniting for each other's advantage. To dispel that ignorance, to show how men can help one another, notwithstanding the complicated state of civilised society, ought to be the aim of every philanthropic person. Remember, gentlemen, friendship is a tender, fragile flower, which can live only where it is reciprocated. Our day of opportunity will soon be past; we ought to stimulate each other to individual exertion. I look upon it that we should clearly understand this. No human pursuit makes any material progress until science has been quickened by intelligence stimulating intelligence; and whenever science is brought to bear upon these pursuits, although they may have been slumbering for centuries upon centuries, the moment science touches them with her magic wand, they spring forward and take strides which amaze and almost awe the be-



holder. Is it too much, my friends, to anticipate such is the future of our profession? As the result of united effort, let us discontinue that icy bearing towards each other, and henceforward treat each other with kindness and gentleness. Do not discourage us, do not frown upon us; an unkind word of criticism passes like a cold blast over tender shoots, and shrivels them up, checking the flow of the sap, which probably was rising to produce multitudes of flowers and fruit. I will now come more closely to the subject immediately before us. I wish to speak as a practical man addressing practical men, and I would ask you individually if it would not be much better for you, if it would not be much more agreeable to you to shake off your old exclusiveness, and cultivate a more cordial feeling, and to know that your separate connections and business were more secure and safe to you, that there was less to deplore in some of the members of our profession, less of that secret, underhand influence at work which in all past times has been a disgrace to our profession, and which even now occasionally exhibits itself in its despicable character, in all its hideous deformity. Do you answer, "Certainly, it would be more preferable;" then I say to you, one and all, join this Association, and to a man see to it that it is conducted in a proper spirit. Do you tell me that the same spirit will still prevail, and operate to the same extent, even when the Association is in full force. This inference I emphatically deny; it cannot be so; it is impossible for it to be so. The mind is imperceptibly led to establish sympathies which will effectually prevent it. If there is only one case of unprofessional conduct where there are ten now (which is what we anticipate), surely that is great encouragement. Let us banish the thought at once and for ever; let us dissipate the delusion that there is no honour in the members of the profession; but if, unhappily, there should be a few nondescripts who are disposed to still act unworthily, let us prove to them by our example that "honesty is the best policy;" let us force them by very shame to follow in our wake. And here allow me seriously to warn the young practitioner, ay, and the older practitioner too, of the lasting injury he sustains by loss of confidence; the impression soon spreads secretly amongst his fellow-practitioners, "he's not to be trusted," "he'll do you a dirty action;" not one of your fellow-veterinarians dare leave their practice in your care in their absence. This character once fairly established has its blasting influence upon you throughout life. No man can succeed in life with such a drawback; not one of them can speak respectfully of him; they all secretly dislike him, and the public see it, and are influenced by the impression; in point of fact, it may be likened to the upas tree, which poisons everything that takes shelter under it. But to the young practitioner, ay, or the older practitioner either, who is ever careful to act with strict integrity, to act honourably and as

true as steel to his fellow-practitioners, this impression gets spread and fixed upon the minds of each of his fellow-practitioners, they one and all respect and esteem him. They feel a confidence in intrusting him with the care of their practice; they will any of them do him a good turn; the public see it, and are not slow at appreciating it; and his success in life is thereby rendered certain. If we will only act faithfully to each other, we have the whole thing in our own hands; there will be no more breaches of professional etiquette; we shall then have a confidence in each other, a right spirit will prevail, and peace of mind will be enjoyed. Our noble profession will then be a pleasure to follow; it will be elevated to a higher sphere, and estimated in society with more respect, and hence it must occupy that status to which it legitimately belongs. Let our watchword be "Onward and upwards," and there is no doubt you will soon become a united, faithful, reputable, and happy body; and then we shall feel a deep interest and unspeakable pleasure in being in each other's society; we shall be able to speak our minds freely, without reserve, for each other's good; then not only will your connections and practice be legitimately respected and safe, but your character and your honour will also be safe in the keeping of your fellow-veterinary surgeons; and thus it must follow that this your Association will in reality be what its most ardent advocates can reasonably expect it to become.

Practically speaking, we know it will ever happen in the common order of things that a customer will occasionally leave you, and some other new customer will turn up. This will happen however clever you may be, and however attentive you may be to your business; and there is nothing in the circumstance at which we are justified in taking umbrage; but if a customer of mine has one of his most valuable horses suddenly attacked with some serious illness, and I cannot be found, or if when found I can be of no service to him in consequence of being in a state of intoxication, and this having unfortunately happened frequently before; or if fortunately I am to be found and am sober, but my knowledge of my business is such as leads me to adopt a method of treatment which is entirely unsuccessful, and this result has unfortunately happened repeatedly before—in such a case, if the employer determines to try another doctor, I have no right to complain or to take umbrage if you, my neighbour, get the customer, and manage to keep him. *This is legitimate*; but if, on the contrary, I am always sober, always on duty, and I adopt a plan of treatment which is attended with as great a measure of success as that of any other practitioner, and with which my employer is entirely satisfied, and he places full, unwavering confidence in me; and in this state of things some other practitioner comes in obtruding himself unasked, unsought, and repeatedly solicits the business, offering to do it at 10, 20, or 50 per cent.



below the price I have for it, and to assist him in his nefarious design he endeavours to raise himself by trampling upon my fair name, this is what I characterise as "*dastardly, unprofessional conduct*," and richly merits to be visited by the severest censure this Association can inflict. Let such a one, I say, be anathema maranatha. As I take it, it may safely be conjectured that the man so acting is either a low-bred, necessitous fellow, or else that he is himself fully conscious of his own inferiority of ability, and offers the article he has to dispose of at his own low estimate of its value, in order to induce the employer to make a trial of the cheap article; but long experience has taught me that such bargains are nearly always soon regretted, and never satisfactory; they sooner or later bring their own retribution. It is unrighteous and discreditable to both parties, and no man of an honourable mind will stoop to do business in such a mean, disreputable manner. Depend upon it, it is suicidal to our professional interests and honour; you are doing, as far as this act of yours goes, a gross injustice to your fellow-man, and branding your own name with infamy, to bring down your profession to penury and ruin—you will be disrespected while living, and despised when dead. Is there any one within the hearing of my voice, or who may read these my words hereafter, ready to make answer and say, "It matters little whether we possess the respect of our fellow-veterinary surgeons or not, so long as we get our own turn served, and it is a matter of sheer indifference to us whether our memories are respected or disrespected when we are in our graves." To this despicable creed I can offer no argument; it can only be met in silence; but to the audacious creature holding such views, I can only say he is beneath the contempt of every man possessed of a well-constituted mind. There is no hope for such a one. He may be safely left to himself and to his own reflections; but by his fellow-practitioners he is sure to be stigmatised as one alike devoid of honour, and utterly unworthy of sympathy. Trusting that in your laudable Association, as well as in our own at Manchester, there will never be found one member to tarnish their fair name, but that they will flourish as the green bay tree, and that much good will be the result; that they shall be what their warmest advocates ardently desire them to be,—viz., mutual improvement societies in every sense of the word; that interchange of ideas will be fruitful of much good; and that we shall thereby be taught to respect ourselves, to respect each other, and to love our profession; and when life's toils are over, as the things of earth are fast fading from our vision, may we be cheered by a consciousness that no act of ours has tarnished the fair fame or honour of our profession, but, on the contrary, we have on all occasions always endeavoured to do our duty.

*On the Removal of a Diseased Phalanx in an Elephant.* By  
MR THOMAS HICKMAN, Veterinary Surgeon.

TO THE EDITOR OF THE VETERINARY REVIEW.

SIR,—In the autumn of 1854, being then only a few months in the country, I was asked one evening after “mess,” if I would pay a professional visit to a member of the Indian Commissariat Corps, to wit, a maimed elephant. Perceiving that Captain D—— of that department was not making an after-dinner joke upon the fresh “Griff,”\* I replied, I should be most happy to do so. At sunrise next morning I was awoken by, to me, a very strange sound, caused by the trumpeting of an elephant. Upon going into the verandah, I saw the mahout (elephant-driver) indulging in a little native “humour,” talking to the elephant in the quaintest manner; and from the varied notes of speech that rumbled forth from out his nasal horn-like appendage, I was convinced that the language of the driver was perfectly understood. Indeed, I rather envied the huge beast’s proficiency in Hindustani lore. It was apparent that he was being instructed to explain to me *viva voce* as well as by dumb motions what it was that his comrade on the sick list was suffering from. This he did in a style and manner that would have brought down thunders of applause, had it occurred at Astley’s renowned amphitheatre. A “salaam,” or native salutation, followed by kneeling down, so as to enable an ascent to the summits of the dorsal vertebræ tolerably practical. Rising, away we went to his sick brother, a sort of dialogue being carried on between the driver and his pet, in Hindoo-elephantine classics.

I found my patient lying on his side, evidently not at ease, and occasionally discharging sand from his trunk right amongst a colony of flies that had settled about his “sore” place. These pests would annoy him during the day, and then at night he would be teased by the “attentive” mosquitoes. Therefore it was to be regretted that he could not have the same hospital protection that is afforded to the horse, viz., fly-screens and sun-shades.

The injury was caused by the penetration of a stake, or possibly he had picked up a piece of pointed iron in the bazaar *two or three years ago*. Having been treated by different native doctors, he had exhausted all their medical agents and surgical skill. The patient was “coaxed” sufficiently to allow of an examination, without recourse to restraining powers. It was found that the phalange, corresponding to the second bone of the fourth toe in the human foot, and on the near side, was much diseased by ulceration of the bone, and large deposits of osseous and car-

---

\* *Anglice*, fresh arrival.



tilaginous matter. Sinuses of large calibre ran in different directions. Around about the wound it was hot, and the skin tense, and had a "shiny" appearance. The granulations were soft; above the surface it was of a pink colour, and plentifully coated with purulent discharge. The discharge from the wound was copious and fetid; a portion seemed healthy, but was mingled with a thin whitish matter, that stunk "aloud."

We cleansed the wound, and applied detergent agents, which was continued for three or four days. Subsequent examinations led me to conclude that nothing less than the excision of the diseased phalanges would be of any benefit towards a cure. I collected a few instruments that appeared suitable for the work, and the farrier-major was very ingenious in the way of improvising a set of "hobbles." I am afraid that we should have required the entire troop to cast him, for the difficulty would have been to get the four feet together. It was no easy matter to coax him to lie down, for he had found that my preliminary examinations were by no means unattended by pain. The "mahout" eventually got him down, and then a rope was fastened to the end of the trunk, and drawn in the direction that prevented him from using it offensively, as well as keeping him in a "subdued" condition. One stout rope was put around the neck, and coiled upon a stout tree. There was the usual chain to the hind leg, and a rope to the "surcingle" held by some dozen natives. The fore-legs were bound together, and the diseased limb extended. He then appeared harmless, but by no means steady, as I found he was sensitive enough to the scalpel. A free incision of about five inches long, and two deep, was followed by another on the other side of the phalanx. A hook was inserted under the horn, and, by force of pulling and cutting, the wedge-like mass was cut away, clean to the articulating surface. Two large arteries were emptying their contents by regular pulsations, about 30 in the minute. These were at once plugged with whalebone probes, previously wrapped with lint and beeswax at their points. These were afterwards withdrawn, when a stout "packing" needle had been passed through each of the arteries. Then a bit of lint was held in the orifice until we could tie it in with the waxed string that we had passed through with the needle, for the arteries could not be drawn out and tied in the ordinary way. Having stopped the flow of blood to a great extent by sponging, we could study the surface; and a very interesting series of views we obtained of the divided ends of nerves, vessels, and ligaments. I did not attempt to bring the edges of the wound together by sutures, but contented myself by the stricture of a series of bandages rather tightly bound.

Having retired to a safe distance, the fetters were removed, and the patient got on his legs, and, after a grunty greeting, he was very much interested in the appearance of his bandaged hind

“pillar;” and I fancied, by an intelligent glance from his “wicked” looking eye, that he bore us no good will. A “bheestie” water-carrier was told to keep the cloths constantly wetted with cool water, and to be relieved by another man during the night. To administer physic to an animal of his size and peculiar nasal and oral formation is never done in any of the several modes used with veterinary patients, and recourse is had to stratagem. He is very fond of “sweeties.” Some sweet boluses were given to him, and, by pretending to carry away the confectionary, he bolted them pretty quickly; and during the greedy moments he was outwitted, down went the medicated pills without his discovering their nauseating property. Some twenty drachms of Barb. aloes were thus smuggled into his abdominal granary, which produced the desired effect in the course of some hours’ time. Perhaps it also produced a little revengeful feeling towards Eli Bwxsh, the Hindoo confectioner, who is well known to him as purveyor of sweet morsels, and is likely to have his shop front interfered with the next time he may be passing his bazaar establishment.

Directions were given as to his food, so as to procure the greatest amount of nutrition from his daily rations. Bandages were not removed for some five days, and then it was found that the plastic formations had been produced to a great extent. The ends of the ligatures were gently pulled away, and the arteries were found closed. It was astonishing to me to observe the rapid formation of granules, which induced me to try the effect of powdered sulphate of copper, for the purpose of rendering them firmer, for they were rather spongiform.

The healing process went rapidly on, and the visits became less frequent—about twice a week. I found, by varying the applications to the surface of the wound, it had a marked effect in accelerating the formation of new skin, or at least a substitute for it. The animal had lately been on his legs a good deal, and occasionally the wounded leg would bear a portion of its burden.

A month after I left the station, and upon making inquiries some twelve months afterwards, when *en route* to Delhi, I found that the animal recovered sufficiently to enable the Government to realize a fair “casting” price; but he was thought to be unfitted for retention amongst the “service stock,” and was sold at the annual auction for something about L.12 sterling.

If you have room for this to be inserted, it may induce some of the junior Indian veterinarians to contribute some cases from their practice, as I have occasionally heard some of my seniors mention cases of great interest; but for some reason or other the climate, I think, has a great deal to do with their apparent indolence.



*Colic, Intussusception, Vomiting, and Death, the sixth day, in a Cow.* By ANDREW SIMPSON, M.R.C.V.S., Fettercairn.

THE subject of this communication was a cow, the property of Mr George Farrier, farmer, Bentfield, of the Angus breed, of small size, a good milker, and seven years old. She was about four months gone in calf. I was called on the morning of the 29th October 1864, to see her as early as possible, as she was said to be very ill, rolling about, and kicking furiously. I concluded it was a case of colic, and gave the messenger a drench— $\mathcal{R}$  Tinct. Opii,  $\mathfrak{z}$ ij;  $\mathcal{A}$ ether Spt. Nit.,  $\mathfrak{z}$ ij; Ol. Lini. Oj—to be given milk-warm in treacle water; also ordered friction to the belly, &c., and promised to call in a short time.

On my arrival I found the animal apparently all right, lying quite quiet. On raising her up, she stretched herself, looked about to her flank, but did not strike with her feet, or attempt to get up and down.

Pulse 60, soft, not having that smart sensation imparted to the finger indicative of inflammatory accession. Ears, legs, and skin comfortably warm, muzzle moist, eye lively, and all appearance of speedy recovery. With a view to open the bowels freely, I gave a drench— $\mathcal{R}$  Mag. Sulph.,  $\mathfrak{b}$ jss; Zingbr. et Gent. Pulv., aa,  $\mathfrak{z}$ j—along with about half a pound of treacle. Left, telling the owner if she took another twinge to be industrious in the application of friction with a wisp. Prognosis favourable.

29th.—I was again sent for this evening, being informed that the medicine I had given her had not acted; that she refused all food and drink, and that her milk was quite gone.

On getting there, I found her standing. Pulse 56, and easily compressible. Ears and extremities cold, skin not so thrifty, eye less lively; told when she gets up she bends her back downwards. Urinary system active.

When standing she stands quite still, and when down lies easily. Gave  $\mathcal{R}$  Mag. Sulph.,  $\mathfrak{b}$ j; Ol. Croc. Liq. gutta xv., with the stimulants and treacle as before. Stimulated the belly with a liniment— $\mathcal{R}$  Lig. Ammon. Fort. et Ol. Teribth., equal parts. Ordered hot seeds to the loins, and to be kept otherwise comfortable, to have as much water as she liked; also ordered frequent enemata.

30th.—Bowels still inactive. Pulse 60, thready, and occasionally intermittent. Ears, legs, skin, &c., more comfortable than they were yesterday. Eye beginning to sink—discharge from both eyes of a starchy-like matter. Breathing performed with some difficulty. Occasional straining, causing protrusion of the rectum to about the size of a man's hand. Lies more generally on the left side, turns her head round to her shoulder, and moans at times. Diagnosed intussusception. Gave a drench— $\mathcal{R}$  Aloes

Barb., 3x; Ol. Lini. Oj—with treacle and stimulants *ut antea*. Applied fomentations to the abdomen. Administered tobacco-smoke and turpentine-enemata alternately, but with no good effect. Ordered good bed and quietness.

31st.—Constipated bowels. Pulse 80, weak. Ears, extremities, and points of teats, cold. Udder shrivelled up almost out of sight. Prolapsus ani about the size of a child's head. The bowel black and cold. Eye very haggard. Rumen tympanitic. Gave Ol. Lini. Oij.; Hydr. Chlorid., 3ij; Ext. Belladonna, 3ij; Treacle, q. s. This dose to be repeated next morning.

Rubbed in 3ss Ol. Crot. Liq. over the region of the third stomach. Continued the enemata. After returning the protruded gut, I found it necessary to retain it by putting in a stick of tape through the sphincter, and drawing the anus sleekly together, and that with another strip attached to the first and tied round the tail was effected in preventing the recurrence of this annoying protrusion.

1st Nov.—Very much worse. Bowels inactive—much distended with gas. Could not ascertain the state of the circulation but by auscultation. Ears, extremities, and teats, deathly cold. Eye very much sunk, and insensible to light. Has vomited about a pailful of the contents of the rumen. Breathing laboured, and a grunt at expiration. Lies almost constantly—does not now look round to her flanks. Has taken about a pailful of water. The vomiting relieved her considerably. The owner had given her about a pound of common salts, with two or three pounds treacle, twice to-day. Gave R Ammon. Sesq. Carb., 3ij; Zingbr. et Gent., aa, iv3, in a bottle of strong ale—repeat every six hours. Punctured the rumen. Continued the fomentations and enemata, *ut antea*.

2d.—No amendment. Much weaker than she was yesterday—evidently sinking. Intermit all remedies. Ordered her to be destroyed. The owner being averse to this, however, I proposed exploring the abdomen by lateral incision. This I did by fixing her to a wall with the side line—extending an incision five inches in a vertical direction from the point punctured yesterday. After having well oiled my arm, I explored all the bowels from the rectum to the atomasum, but failed in discovering the obstruction. I then brought the wound together by the ordinary method. She was left quiet, and died the next morning.

I may add here that she got walking exercise frequently. I also had her cast and turned over on her back two or three times, thinking that change of position, or the struggling during this operation might overcome the obstruction. But, no!

*Post-mortem*.—Body considerably emaciated. On laying open the abdomen, the whole viscera presented a pale red tint. There was also attachment between the rumen and peritoneum, from the part punctured to a considerable distance all round. Besides



the above, nothing abnormal was apparent. After removing the stomachs with great care, I removed the bowels, tying the commencement of the duodenum and the termination of the rectum. I passed them through my hands. The large intestines were healthy; the appearance of the ileum, about two feet from the ileo-cæcal valve, explained the obstinacy of the constipation, and at the same time confirmed my diagnosis. At this point the bowel was covered with a thick coat of lymph, and considerably distended by the upper part of the gut having dropped into it, a distance of six or eight inches. The internal duplicature of the bowel was quite strangulated. I need not describe it, however, as I herewith send the morbid specimen in the hope that it will be of some interest to you at this part of the session. I have not attempted to disentangle the bowel, that you may have an opportunity of seeing the parts as I saw them when removed. If the subject be thought worthy, I will await your remarks. On showing the specimen to a surgeon of eminence in this neighbourhood, he said it was the most perfect specimen of intussusception he had ever seen. On discovering this sufficient cause of death, I made no further examination.

*Cause.*—I have no doubt the exciting cause was an over feed of wet turnips.

The cow was a gross feeder, and the attendant having to go from home on the afternoon previous to the attack of colic, gave her an extra quantity to serve till next morning (they served her well, she never required more). This produced colic. The invagination of the gut was a consequence of the perverted action of the bowels characteristic of that disease.

---

*Veterinary Records.* By G. ARMATAGE, V.S. to the Marchioness of Londonderry.

#### MUSCULAR ATONY AND MALFORMATION OF LIMBS IN FOALS.

THIS disease is recognised under various names, as *Cripple Toe*, from the acts of progression being principally performed on the toe; *Cripple Felon* and *Foot Felon*, from a supposed analogy to or connection with disease of a rheumatic character; and *Guide Felon*, from a belief that the tendons are contracted and diseased.

As it appears in various districts, it doubtless obtains other terms of like ambiguity and imperfect signification.

Like all such diseases which arise from causes not easily comprehended by the owner, it is not an uncommon thing—particularly among the ignorant—to see some strange farce enacted for the removal of the malady in the young stranger. As it is known always to be present at birth, the sire or dam *must* be to blame; and if peculiar charms should lose their virtue or a want

of proper knowledge exist for their direct application, then the *Yarbs* of the field with never failing properties are brought to bear. Should, however, success *not* attend these, after applied in the shape of poultices and fomentations, or administered to mother and offspring as drenches at various times, then without doubt the stallion, mare, or foal, or perhaps the three are bewitched, in which case the opinion of the wise man of the village is sought as a *dernier resort*, who perhaps reaps the lion's share of the fortune, or *misfortune*, whichever it may be.

In this enlightened nineteenth century, the veterinary surgeon will still find ample scope in some districts for the exercise of his scientific skill and powers of convincing argument in proving the non-existence of diseases in connection with such unnatural laws; and it would be well for him to set about the task in right earnestness, as well on the score of his profession as in reference to the education of his client, but in either case should step for a time from his pedestal of erudite science, anatomical nomenclature, and detail of intricate pathological signs and changes, &c., and descend to the mediocre understanding of his employer, whose animal doubtless represents as fair a share of value in the establishment, and deserves consideration on terms equal with those of the rich farmer or landed proprietor.

The exact causes of the complaint appear to be somewhat doubtful. It has been known to be present in foals which were born with tardiness, or where force has been applied to the limbs to facilitate parturition; but since it also appears apart from these causes, and when the process of delivery has been accomplished in the natural manner, the true origin would appear to rest in some constitutional peculiarity—a want of general nutrition—as it appears under the effects of premature birth or imperfect condition of mother or offspring, or both. Of its hereditariness there is no doubt; fillies affected at birth have subsequently borne animals in the same condition year after year, although the sire was perfect and changed frequently.

The stock from certain stallions also appears to be predisposed to it, since it has been known to prevail in a particular locality where many owners have used the same animal. This practice of too frequently using the same blood, together with the manner of keeping, housing, &c. by small occupiers, and the combined effects of low, wet, marshy grounds, may furnish the exciting causes of the malady. In a village presenting these characters, the writer, on one occasion, saw three animals labouring under the disease.

The symptoms are peculiar and well marked. As the animal stands there is an appearance of great insecurity, the legs and body shake and tremble, the former being repeatedly shifted as if to obtain a firmer position when each time the toe is implanted a short distance in advance, and the weight of the body descending upon the incurvated fetlock joint brings the whole of the anterior



surface of the os suffraginis to the ground, the heels of the hoof approximating the ossa sesamoides behind, as shown in figure 1.



The toe and front of the hoof are thus considerably worn, and the coronet and postern denuded of hair, but covered with a thickened scaly skin.

During the vigorous efforts and rapid movements occasioned by fright, &c., the whole limb is raised at the shoulder, the knee and fetlock arched, and as the limb is advanced, it is done so spasmodically, suddenly, and with a jerk; the toe is dug, as it were, into the ground, about half the distance comprised in a natural step, the body thrown backwards

upon the hind limbs, which gives the appearance of the fore limbs being excessively in advance of the body (see figure 2). The tendency which exists in the phalanges for undue flexion often causes the animal to fall for-



Fig. 2.—Atonia Muscularis Congenitus.

ward, the limbs doubling up beneath the body when he lies for a time, making ineffectual attempts to rise, and when successful, stands trembling violently, being considerably excited. This fact tends to show the whole muscles of the extremities are more or less involved in a general state of incapacity for ordinary locomotion.

The majority of cases demonstrate the affection to exist principally in the extensors of the fore-legs, but sometimes the flexors of the hind limbs are similarly attacked when the movements are

very greatly impeded, the animal falls more frequently, and of course in a reverse manner. In the latter cases the phalanges are flexed in the same manner, but not so severely as the fore limbs when affected.

The duration of the complaint has been known to exist for months, young animals of five to eighteen months old having come under treatment.

It is mostly curable, some cases assuming a healthy condition without medical treatment; if, however, our attention is directed to the malady with a view of affording assistance, and the patient is still running with the dam, the latter will first demand our notice, in order to establish a healthy and nutritive secretion of the lactic fluid. Succulent food, as young clover, or a dry, good pasture, out of the reach of strangers, with ample shelter, should be provided; and a daily allowance to the dam of crushed oats and beans or peas, given in small and repeated quantities, must not be omitted. But a good roomy box, where mother and foal can be safely lodged, under the care of an experienced and earnest attendant, is to be preferred; both will then receive more perfect attention than when located at a distance; besides, they escape the annoyance of flies and the sun in extreme hot weather, and are secure against the cold winds of early morning or night, and rains, &c., which are no aid, but to be regarded as serious obstructions to the perfection and cure of the patient. It is well known that frequently when animals are kept on green food they will refuse corn altogether; in this case, therefore, where the nutritious principles of corn are so much required, the consumption is more easily secured by mixing it with finely cut green food, a form which, after a short time, is very readily partaken of.

It is not necessary, in most cases, to administer medicine to the foal, the measures resorted to for the restoration of normal digestion and assimilative action in the mother being alone sufficient. If, however, circumstances call for interference, an oleaginous dose may be prescribed. The limbs demand the greatest attention, the affected muscles of which will be found to be flabby and attenuated, or if possessed of their natural contour and volume, soft and flaccid; to these the Tinct. Arnica Mont. dilut. may be applied with smart friction morning and evening. Other applications, as the Ol. Lyttæ, or Ol. Mylabris Chichorii, the Lin. Ammonia, Turpentine, &c., will be found of especial service, according to the degree of action and effect desired.

The period towards recovery varies; sometimes perfect attitude and progression will be obtained within a few weeks or days; at other times the process is slow, but gradual and resolute.

The disease has been confounded with contracted tendons, and an operation for such sought for and obtained; but to an observant eye an ordinary examination will demonstrate the non-



existence of diseases of those tissues, or implication of harder structures in abnormal action, states seldom found at the same period at which the disease we have attempted to describe generally happens.

It is also confounded with rheumatic affections, and treated as such; but in the absence of all febrile excitement, heat, pain, and tenderness, excessive lameness in one or more limbs, or probably alternating—the fore with the hind, or *vice versa*—and a joint, the principal seat of the affection, sufficient will be found to establish the difference in the two diseases.

As it is common to colts and fillies of the heavier breeds, and particularly those belonging to poor owners, and on small farms in low, wet, cold localities, the pathological signs which characterise its nature, duration, &c., and treatment which successfully dissipates them and restores the parts to healthy function, all go towards establishing the idea of such an affection being throughout its phases nothing more or less than the result of imperfect nutrition and development of muscular parts; the term, therefore, which has been placed at the head of this article, may not be inappropriate as characterising an affection which the conclusions of daily practice also strongly and fully bear out.

So far as I am aware, no article has been written on this subject in the English language; but, nevertheless, do not suppose it has entirely escaped the notice of our profession. In the "Veterinary Review" for October 1858, page 203, a translation from the "Journal de Médecine Vétérinaire" appears, in which a case of similar characters is detailed as occurring in a foal fifteen days after birth, which walked upon the knees, being born perfectly straight. The nature of the affection—in the estimation of Bracket the writer—was purely rheumatic, arising from the flooding of the rhone. Tenotomy was performed behind the arm on each limb at different periods, and the animal recovered, with the exception of an amount of stiffness being present in the knees.

At page 208 of the "Review" also, there is given a case where the malformation appears at birth. M. Rossignol, the veterinary surgeon in attendance, was not determined whether the affection depended upon powerful contraction of the flexor tendons, or a deficiency in tone and strength of the extensors, but performed plantar tenotomy, by which the animal was rendered sound in two months.

My own opinion is, as previously hinted, that the disease is no more or less than a want of normal power in the extensor muscles of the legs when it happens in the fore extremities, and of the flexors of the hind limbs. In no case have I found symptoms to warrant the recourse to an operation, either from an estimate of the real nature of the affection, or presence of disease in those structures upon which the knife should be exercised.

# EDINBURGH VETERINARY REVIEW

AND

## Annals of Comparative Pathology.

---

### PRELIMINARY EXAMINATIONS.

WHEN reforms are proposed, it is necessary to ascertain if we are ripe for them. The veterinary profession is undoubtedly ripe for some improvements, and it is with great pleasure that we witness a tendency for advancement. We cannot, however, coincide with the views entertained by those who are now in hot haste for establishing preliminary examinations. We do not wish to neutralise their efforts. Our sympathies are all with the promoters of measures calculated to make veterinarians wiser than they have been; but it is necessary to ask whether the young men who are now entering veterinary colleges are so sadly deficient in the rudiments of an English education as to prevent them learning all, and indeed much more, than is now taught them in veterinary schools. We notice yearly improvement in the qualifications of students; but what we do not notice is any marked improvement in the curriculum of professional education. It is well known that the great strides in popular education during the last twenty or thirty years have led to changes in the qualifications of young men entering all colleges, and the veterinary profession is benefited by the restrictions placed on those aspiring to become medical men. The ranks have been thinned in medical schools to an extent which no one could have anticipated as a direct result of increasing the difficulty of examinations. Are we in a position to follow the example of universities? We think not. Medical schools have developed the student's curriculum to such an extent as to require a considerable amount of classical education. They have been so thronged as unquestionably to overstock the medical world. But we are not in their position.



Our professional education is still scanty, and the number of candidates for the Royal College Diploma are far below the requirements of the age.

But what kind of preliminary examination is it intended to institute? Not a severe one, and little more than is to satisfy us that our students can read and write. A very superficial inquiry must convince any one of the fact, that many of the smart-looking, but less industrious and intelligent students, have been trained in their school days to fit them for writing, reading, and speaking in good English. They have not attained higher positions in College, and often not so high, as rusty-looking men from the highlands of Perthshire, or the Aberdeen valleys, where the pronunciation is bad, manners uncouth, writing awkward, but love for work and desire for advancement well-marked and characteristic.

With the discordant elements now in operation—with four veterinary colleges depending on the number of students for their existence—is it likely that men rejected at one place would not find their way into the profession through another? The schools where the preliminary examinations would not be a mere matter of form must suffer for their honesty; and it is not likely that they would hold out against competition. It is our desire to see the examinations for the diploma of a more practical character; to see an extension of time for attendance at College; a shortening of vacations; better sub-division of lectures; more time for dissections; better clinical instruction; and then, but not till then, we shall be glad to follow the plan only recently adopted by medical schools, of checking the influx of students whose qualifications for an extended course of scientific study may not in the estimation of some be of a sufficiently high order.

## VETERINARY JURISPRUDENCE.

—o—

## DISEASED MEAT CASES.

IN the Burgh Court, on 5th November, William Robb, flesher, Causewayside, was charged, at the instance of Mr Dymock, Procurator-fiscal, with having had the carcase of a cow in the Slaughter-Houses, on the 31st October, which was unwholesome and unfit for human food. Bailie Alexander was the presiding Judge, but Bailies Hill and Falshaw were also present. There were other two cases of a similar nature, but the hearing of these was deferred till Tuesday. Mr Dymock conducted the case for the prosecution, and Mr Comrie Thomson, advocate, appeared as counsel for the accused. The Court was crowded to excess.

Mr Duncan, Gatekeeper at the Slaughter-Houses, gave evidence as to the cow having been brought to the Slaughter-Houses on Monday the 31st October, between seven and eight in the morning.

Robert Wilson, Inspector of Markets, deponed that he had examined the carcase and one of the lungs, and found that the other lung had been thrown into a barrow in a diseased state. He was of opinion that the animal was in a diseased state, and that it was unwholesome and unmarketable.

Cross-examined by Mr THOMSON—The diseased lung had been put in the dung barrow, and when he saw it he found it was all marled and diseased. The lung was warm at that time. He examined the flesh, and looked at the ribs, and observed them scraped. He observed also a little water on the flesh. He considered that it was an easy matter to discriminate when meat was diseased or sound. He could easily tell the state of a carcase by looking at it. It would be better to cut it, but he did not cut it in this instance. He did not know whether it was customary to take a piece off the shoulder or spare rib to see whether disease was present. It was on Monday when he examined the lung and found it warm. He did not feel the carcase, and could not say whether it was warm. He was appointed Inspector on the 10th of last month. He came from Dumfries, where he was a farmer. Nineteen years ago he had been a flesher in Edinburgh, both as an apprentice and a journeyman. Nobody could appeal from his judgment in the Slaughter-Houses as to the condition of animals. As a man of skill he was of opinion that the disease in the lungs constituted unsoundness. Any amount of pleuro makes an animal unsound. He believed that even in the first stages of the disease it was detrimental, but he would not condemn an animal in the first stages. In this case the fat was yellowish, and the flesh dark and sticky. The lungs had been washed and scraped to take away the matter that was on them. The place from which the lungs had been taken was also scraped.

William Ranken, who was employed assisting about the Slaughter-Houses, gave evidence as to the animal having been examined by Wilson and condemned.

Cross-examined by Mr THOMSON—One lung of the animal was slightly affected. We put it into a dung barrel. Wilson said he could not give any opinion as to the animal without seeing the lung. When the lung was got Wilson just glanced at it, and did not touch it. He did not make a careful examination with the view of examining the state of the flesh. In my opinion the cursory glances that were given by Mr Wilson were not sufficient to enable one to pronounce an opinion as to the state of the animal. It is the common practice to put diseased lungs away.

Professor Gamgee, examined by Mr DYMCK, deponed—I have had great experience with regard to diseased meat. I examined this cow on Tuesday last,



and it was obviously the carcase of a diseased animal. On a careful examination, I observed that on the left side there were marks of very severe bruises, such as we find on animals that have been lying some time prior to being destroyed. These bruises were on various parts of the body. I examined sections of the meat, and I found that instead of the beef being full of juice it was dry and clammy. I then found that the animal had been affected with pleuro-pneumonia, and I asked for the lungs. I was told that the diseased lungs were usually removed. I found marks of disease on the chest. The flesh where the diseased portions had been removed was soft and flabby. My opinion was that the animal was unmarketable. If you seize any diseased animals at all, of course you must seize such an animal as that. It was unfit for human food. I would not like to eat it myself. It was unwholesome and unmarketable.

Cross-examined by Mr THOMSON—Supposing that I had eaten a part of this cow, it would perhaps have done nothing to me at all, as our stomachs have a great power of control, and often expel animal poisons. It is an ascertained truth in science that the consumption of the meat of animals affected with pleuro-pneumonia will produce disease in the consumer. I say that it is an ascertained fact, because there has been the manifestation of carbuncular disease where animals affected with pleuro-pneumonia are largely consumed. I have not seen any cases of carbuncle produced by eating pleuro-pneumonia meat. I have seen cases of inflammation of the eyes and skin. The septic fluid irritates any surface to which it is applied. I have known as many as four people suffering violently from cholic and diarrhoea. I am not prepared to state their names.

Mr DYMCK—We are not getting into a system of medicine.

Mr THOMSON—You will have a system of medicine before we are done. This gentleman has sworn that when an animal is affected with pleuro-pneumonia it is unwholesome and unsound; and I am crossing him as to his knowledge of that fact; and I will cross him as long as I like, because I am going to lead evidence on that, and that is the whole point.

Bailie ALEXANDER—According to the statute, if you can prove the meat to be unmarketable that is sufficient, even though it is not unwholesome.

Mr THOMSON—If unmarketable means unsaleable, I will bring plenty of butchers to say that they will purchase it and sell it. But my client is charged with having meat unfit for human food in his possession, and that is the theory on which the case goes. If the case is going to be reduced to the question whether the meat is marketable or not, that is a different matter; but I am entitled to lead proof in contradiction of the whole charge, unless it is formally reduced to the charge of unmarketable meat merely.

Cross-examination of Professor Gamgee resumed—Pleuro-pneumonia may exist in its earliest stage without the animal appearing to be affected by it. The meat will do no harm in the very earliest stage of the disease. I have had students of my own college who were affected by eating diseased meat. I have not traced carbuncle to eating any particular piece of diseased meat; but I have found carbuncle prevailing among large numbers of people whom I have known to be eating pleuro-pneumonia meat.

Mr DYMCK—I think the only question with which we have here to do is whether this cow was or was not diseased?

Mr THOMSON—That is the only question; but how is the Bench to ascertain that fact unless by the testimony of men of experience. You have brought your man of experience, and I am going to show you that his experience is not worth much. That is what I am bound to do, and what I am instructed to do; and I am going to bring witnesses to prove that their experience is exactly contrary to that of Mr Gamgee.

Cross-examination of Mr Gamgee resumed—I received intimation that in the south of England, in Portland Prison, carbuncle was largely prevalent, and communicated with the authorities, and ascertained that carbuncles were far more prevalent there than where pleuro-pneumonia beef was not consumed.



The report was, that meat in all stages of pleuro-pneumonia was being sent there, and that meat being consumed led to this disease. Pleuro-pneumonia meat produces certain specific diseases, carbuncle and diarrhœa; and if the septic fluid touches the skin of any part it produces inflammation. It is my opinion that it is a proved fact in science that pleuro-pneumonia has these specific effects. I might mention that some of the cases of inflammation of the skin and eyes have been seen in the Edinburgh Slaughter-Houses. I gave evidence at considerable length before the Committee of the House of Commons. The report in the blue-book is generally correct. (Mr Gamgee was here cross-examined at some length as to the list of dairymen and the number of diseased cows, on which he was examined before the Committee of the House of Commons, in the course of which he maintained that the letters from the Edinburgh dairymen, which were read in the Committee, did not break down his evidence in the opinion of the Committee. He denied that he had made statements to the Committee which had been publicly disproved, and he gave it as his opinion that though the Cattle Diseases Bill did not pass, it would yet become law.)

Dr Littlejohn, Medical Officer of Health, examined by Mr Dymock, deponed—I saw Mr Robb's cow on Tuesday last. The first thing that attracted my attention was the number of bruises that existed on its surface. This was especially marked upon the left side, where the bruises were considerable, and they had evidently been upon the animal for some time. I examined the flesh of the animal. The meat upon being touched was dry and clammy. There were evident marks of disease. The midriff was decomposing. The left lung was healthy, and I asked for the right lung, but it could not be found. In a case of decided disease, there is no necessity for a lengthened examination; the eye becomes so much accustomed to traces of disease, that you can detect it in a few seconds. My opinion is that this animal was diseased, unwholesome, unmarketable, and unfit for human food. I have seen Mr Wilson examine animals, and I have been struck with his acuteness in detecting the appearances of disease, and with the manner in which, from the mere appearance of an organ, he could make out whether it was diseased or not.

Cross-examined by Mr Thomson—It is exceedingly difficult to say what disease is produced by eating pleuro-pneumonia food—it depends upon the constitution of the individual. A healthy man might suffer comparatively little from eating such meat once, but if he continued to eat it his health would suffer. The amount of injury to health would depend upon the stage of pleuro-pneumonia in the animal. When the animal is affected to the slightest extent with pleuro-pneumonia, it is unfit for human food in consequence of disease. As medical officer of health for the city, I consider such an animal is unfit for human food. I am sorry to say that it is consistent with my knowledge that animals are sold which are slightly affected with pleuro-pneumonia. If all the animals affected with pleuro-pneumonia were condemned as unfit for food, butcher meat would possibly be much dearer for a few weeks until the butchers knew that they could not introduce such animals. The breeders would just take better care. It has not yet been ascertained as a fact in science that specific diseases have resulted from eating pleuro-pneumonic meat, but there are many cases of disease which we cannot account for except on some such supposition that they are caused by eating diseased meat; I have never myself seen cases of disease from eating diseased meat. I wrote a letter to Mr Hall Maxwell, in which I stated that since 1854 I had seen no cases in which I could trace a connection between disease and eating diseased meat.

By Mr Dymock—It is the very poorest of the community that eat this meat. They are often complaining, and the poor people do not know how to make their complaints known to the community. It is also to be borne in mind that the meat is not roasted, but subjected to continued boiling, which tends to deprive the meat of a great deal of its unwholesomeness.

By Bailie ALEXANDER—In my experience I have known parties swallowing poison and no bad effects resulting from it. I have often heard of cases of



vomiting after taking meat, and one can easily understand how in such cases diseased meat has been taken, and the person taking it has not suffered in his health.

This closed the evidence for the prosecution, and witnesses were then called for the defence.

Mr Robb, the accused, was first examined by Mr THOMSON. He deponed—I am a butcher in Causewayside. I have been six years in business in Edinburgh. I purchased a cow from Mr Begbie, a dairyman in Edinburgh, last Monday. I went to see it on the Monday. It had hanged itself, but it was still alive and I killed it; it was flayed in the byre, and I took it in a cart to the slaughter-houses. The blood was quite pure that came from the animal. I waited till it was skinned. I saw a mark on the shoulder, which had been caused by its struggling with the rope. I observed that it was touched in one lung, but very little. In my opinion that was not sufficient to render it improper food for consumption. I have seen such appearances, and far worse, dozens of times, in meat that I have seen and that other parties have sold. The animal had got a bruise on the side as from a blow. I have no means of accounting for that. A severe blow in the side with a stick would not affect the lungs. I have no hesitation in staking my reputation as a butcher in selling the meat of that cow, and I would have no hesitation in eating it either, even had it been far worse. I took it into the market openly in the usual way.

Cross-examined by Mr DYMCK—There was no bargain made as to what I should pay for the cow.

By Mr THOMSON—The beast was hanged, and the sooner it was dressed the better.

By Mr DYMCK—Was it because you were not sure whether it would pass that no bargain was made? There was nothing said about that. Mr Begbie was to see me after it was dressed. I was in the slaughter-houses when it was dressed. I saw the lung that was diseased. I did not order it to be put on the dung-barrow.

By Bailie ALEXANDER—I do not know whether other parties make no bargain for animals which have been suffering with pleuro-pneumonia until they see whether they will pass; but I know what I did myself. I never heard of such a practice myself.

By Mr DYMCK—If it had passed, I would have paid L.12 or L.14 for it.

By Mr THOMSON—I knew Begbie. I had no doubt about trusting him.

Mr Ramsay, Superintendent of the Slaughter-Houses, examined by Mr THOMSON—I saw Mr Robb's cow brought into the Slaughter-Houses on the 31st October. I saw part of the intestines, and I saw Mr Wilson the inspector take the lung and wash it, and look at it. I looked at the carcass when Mr Wilson inspected it, and it was in the earlier stage of lung disease. Mr Wilson washed the lung, squeezed it, glanced at it, and threw it aside. He just looked at the carcass; he did not cut it. I think the animal was quite fit for human food; it was affected with pleuro-pneumonia, but not to such an extent as to render it unsound, unwholesome, or unmarketable.

Cross-examined by Mr DYMCK—My term of office as superintendent is drawing near a close. I have been dismissed. I suppose they say I am incompetent to inspect the beasts; but I believe the real state of the case is that the Market Committee was made to believe so. (Shown Edinburgh Slaughter-Houses Book of Records.) That entry is in my handwriting; but Mr Wilson is inspector there, and I am merely a man of straw. That entry is the opinion of Mr Wilson, and not mine, though it is in my handwriting.

By Bailie ALEXANDER—In one instance I have seen the lungs of a healthy animal shown to the inspector as the lungs of an animal which was really diseased. I said nothing about that, but allowed Mr Wilson to pass the animal in the belief that the healthy lungs belonged to it. It is consistent with my knowledge that an arrangement has been made between dairymen and dealers in such animals that if they pass they will get a certain sum of money. I have heard of cases of that kind.

By Mr THOMSON—I never heard of Mr Robb doing that.

Mr Swan, cattle-salesman, was next examined by Mr THOMSON, and deponed—I saw Mr Robb's cow, and thought the meat was very good. It was dressed when I saw it, and it was quite firm, and excellent beef. I do not know whether it had pleuro-pneumonia or not, but if it had it was very slight. The beef was quite firm, sound, wholesome, and marketable; and if such beef were destroyed it would be a great sin and a great evil. As a man of experience, I think that cow was wrongly condemned. I would say that the man who condemned it was not a judge of beef. I would consider that beef would become a medicine if all beef like that cow were condemned, as one-half of the beef killed is not much better. If such animals as this were to be condemned, the price of beef would go up to a ridiculous extent. I never saw the present inspector. I believe the man has a good character, but I believe he has had nothing to do with butcher-meat for twenty years.

Cross-examined by Mr DYMCK—I did not see the internal organs of this animal. I looked at the beef. If an animal has been diseased, I can tell that without seeing the internal organs. If the beef is firm, that shows the beef is fit for human food. If an animal dies of fever, the flesh is not firm. If an animal died of fever suddenly, after a day's illness, the beef would show that it was diseased.

Mr Thyne, flesher, examined by Mr THOMSON—I saw Mr Robb's cow, and I think it was very good beef—wholesome, sound, and marketable. I would have had no hesitation in selling it. I believe no complaint could readily be made of it. It would be a serious thing for the business, and for the public generally, if such meat were to be condemned. The beef was firm, and not wet. I look upon wetness in the flesh as an indication of disease.

Cross-examined by Mr DYMCK—I do not sell cow beef at all; but I would have no hesitation in giving this beef to any person, so far as its soundness goes. I sell nothing but ox beef. My place of business is in Stockbridge. I have been in business forty-two years. I gave a certificate to Mr Wilson, the present inspector, of his perfect fitness to discharge the duties of an inspector's office.

By Mr THOMSON—If I had known Mr Wilson would have condemned this cow, I do not know that I would have modified the terms of my certificate in his favour. The best of men will go wrong at a time. (Laughter.)

By Mr DYMCK—And perhaps you have gone wrong at this time?—(Renewed laughter.)—I do not think so.

By Mr THOMSON—In condemning this cow, Mr Wilson has rather disappointed my expectation of his capacity.

Mr John Snow, flesher, who was the next witness, deponed—I saw Mr Robb's cow, and I found the beef fit for the market. To the best of my judgment, I think it should have passed. It is not the kind of meat I sell. I sell only ox beef. I would not have hesitated to sell this on account of its being unwholesome. I have no doubt it was wholesome. It had suffered slightly from pleuro-pneumonia. It is the practice to sell animals suffering slightly from pleuro-pneumonia, and I have heard no complaints. In the advanced stage of the disease the animal gets wet and flacid. There were no indications of that in this animal.

By Bailie ALEXANDER—I consider that an animal labouring under pleuro-pneumonia is quite fit for human food, up to a certain stage of the disease. When the disease begins to go into the ribs, and shows water, that is the time the animal ought to be condemned. I remember examining an animal belonging to Mr Tait on the 19th September. I remember recommending that the bad bit of the rib should be cut off, and that the rest should be sold, because there was no water. I recommended that part of the animal should be removed, because it did not look very well. I thought the whole of it was perfectly good, but I said, "Better cut off this, and sell the rest." The meat might be not fit for market, and yet wholesome.

By Mr DYMCK—I do not think it is a deceitful thing to cut off a piece that



is looking bad, and to sell what looks well. I have seen a piece of a bullock cut off with an ulcer in it, and the rest of the animal all good.

By Bailie ALEXANDER—I have seen a great many animals killed that were suffering under pleuro-pneumonia, and the midriff bit taken away, and the rest all sold.

By Mr DYMCK—The midriff in this case was not wet. It was not decomposed; it was good, but not perfectly good. There was a small piece off the end.

Dr Grainger Stewart—I am pathologist in the Royal Infirmary. I examined Mr Robb's cow. It seemed to me, so far as I could judge, perfectly good. I had certain portions of the flesh cut out and took them with me to the Infirmary to look at them more narrowly. I put portions of them under the microscope to see if there was any morbid appearance, and there was none. So far as I could judge, no person would be justified in pronouncing the animal diseased from merely looking at it as it hung up. I could give no opinion as to whether the animal had been suffering from pleuro-pneumonia. All I can say is that the tissues which I examined were wholesome, so far as I could see. There are very conflicting opinions as to whether the eating of meat affected with pleuro-pneumonia would be followed by disease; but that is not in my own department.

Cross-examined by Mr DYMCK—We may be able to tell the cause of death without seeing the internal organs, but not necessarily. The diaphragm did not attract my special attention. The condition of a typhus fever patient in an early stage is a peculiar dryness of the flesh, with a fluidity of the blood. In the case of inflammation of the chest you have no recognisable change. There was no appearance whatever of change in this case.

By Bailie ALEXANDER—I have not the slightest evidence to give as to whether this animal suffered under pleuro-pneumonia. All I have to say is that the flesh was carefully examined by me, and it appeared to be good.

Dr Alexander Wood, examined by Mr THOMSON—It is a difficult matter to pronounce an opinion as to whether this animal was suffering under pleuro-pneumonia, because I could see none of the entrails. There was some thickening of the pleura—some deposit upon the pleura; but a good deal of it had been scraped away. We examined other cows which were sound, and we found that they were also scraped in a similar manner. I dissected a piece of the pleura in three parts of the cow, and cut sections of the muscles, and examined these with the microscope, and there was nothing but the thickening of the pleura, probably the result of inflammatory action, and the muscular tissue was quite healthy. I saw nothing in the flesh of the cow to indicate any unsoundness, and it seemed to me to be quite fit for human food. There were evident traces of inflammation of the pleura that had existed. There was a fractured rib, which might have accounted for the thickening of the pleura. It has not been ascertained that disease will follow the eating of meat affected with pleuro-pneumonia. Pleuro-pneumonia may so deteriorate the flesh of an animal that has suffered long from it as to render it innutritious as food; but I do not suppose that any one knows any disease that pleuro-pneumonia has given to the human subject. It is not proved that carbuncle or violent diarrhoea are the necessary consequences of eating pleuro-pneumonia meat. The case that created that opinion was a case that occurred in London where certain sausages had been partaken of by about sixty people, and the eating of these sausages had been followed by diarrhoea in the whole of those who partook of them, and there were one or two deaths. Dr Letheby investigated the case, and he discovered that part of the meat used in making the sausages had come from a cow that died of pleuro-pneumonia; and it was set down that the pleuro-pneumonia meat caused the death; but Mr Simonds made a further investigation, and he discovered that rotten pork had been put into the sausages, which was sufficient to account for the illness and the deaths. I believe the idea of pleuro-pneumonia meat having produced the illness of these people is now abandoned. By far the most



scientific evidence we have on this subject was collected by the Society of Veterinarians in Switzerland, who, after an elaborate investigation, printed a report, which states that the flesh of pleuro-pneumonia animals is not injurious; and that has not been contradicted by scientific investigation. There has been a great deal of assertion, but I am not aware of any proof on the other side. If pleuro-pneumonia had gone on to a very great extent, the state of the flesh would show that, as it would be flaccid and wet. No disease of that serious character can go on long without affecting the whole system of the animal. Neither by the eye nor by the microscope could I detect anything wrong in the condition of the flesh of this animal. I will eat a beef-steak off that cow if I can get it. (Laughter.)

Cross-examined by Mr DYMCK—I saw no bruise in the flesh. The surface of the meat was not clammy to the touch.

By Bailie ALEXANDER—I observed that something had been scraped off the ribs, but we saw cows that had been passed in the same state. A gentleman at the Social Science Congress in Edinburgh stated that death had been caused by eating diseased meat, but there was not the slightest evidence of the fact adduced. I should not like to eat a lung that was effected with pleuro-pneumonia; but I believe that, for a considerable period after the disease has commenced, the flesh of a cow that is effected with pleuro-pneumonia may be very safely eaten. (Applause from the audience, which was checked by Bailie Alexander.) If the disease goes on to affect the entire animal, then, when the flesh of the animal becomes affected, I will neither eat it myself nor recommend others to do so; but there is nothing that affects the flesh in the earlier stage of the disease, and therefore the flesh may be eaten. I cannot tell at what stage of the disease the flesh becomes affected, but if you show me the flesh I will tell you whether it is normal or abnormal.

By Mr THOMSON—If a butcher took away the lung that was affected with pleuro-pneumonia, he would do nothing that is bad. The fact that the lung is bad for food does not necessarily imply that the rest of the animal is bad also. I spoke to a very large farmer in East-Lothian after the Social Science meeting here, and he told me that he had pleuro-pneumonia once among his cattle, and that whenever he saw it he slaughtered them and got the highest price for them as food. They were in good condition, and he had not the slightest idea that he was doing anything wrong. That was a person of the highest respectability.

By Mr DYMCK—If a man dies after four or five day's illness from inflammation of the lungs, the muscles would not be affected. The muscles of a cow would not be affected which died after four or five day's illness from the same cause.

Professor Dick, examined by Mr THOMSON—I saw Mr Robb's cow, and I consider that it is perfectly fit for human food. I consider the flesh perfectly sound. It presented no appearance of wetness. I think that, by examining the flesh itself, you can be perfectly satisfied of its soundness; and so satisfied was I of the healthiness of the carcase that I am ready to eat a steak of it just now. (Laughter and applause.)

Cross-examined by Mr DYMCK—I fancy you would not give your friends that steak?—Yes; and many of them would lick their lips after it. (Laughter.) Many of those who make a work about it do not know what diseased beef really is.

By Mr THOMSON—I would not think any butcher would be acting dishonestly that was selling that meat.

Mr Strangeways, Professor in the Veterinary College, deponed that he had examined Mr Robb's cow, and considered it perfectly free from disease.

By Bailie ALEXANDER—The flesh was firm, and of good colour.

By Mr THOMSON—The fact of the lung being bad does not necessarily imply that the flesh was bad. In my judgment, the flesh was quite fit for human food.

This closed the evidence.



Mr Dymock then briefly addressed the Court for the prosecution, maintaining that he had, by the evidence of competent judges, proved that the carcase of this animal was unwholesome, unsound, and unmarketable; and that he was therefore entitled to a conviction under the statute.

Mr THOMSON next addressed the Court for the defence. He began by reminding the Court that the case must be decided solely upon the evidence which had been adduced, without reference to any information which the Court might have derived from other sources as to the state of the meat trade in Edinburgh. There were three questions raised in the case—1st, Was the cow in any part suffering from disease? 2d, Was the flesh of the cow suffering from disease, even supposing that other parts of it were suffering from disease? and 3d, Was the disease under which the cow was suffering such as to render it unsafe for human consumption? There was no doubt that one of the lungs of this cow was slightly affected with pleuro-pneumonia; but with that admission he stopped, and he pleaded that there was no evidence that any part of the animal which was matter of human consumption was in the slightest degree diseased; nor was there any medical testimony that, even supposing the whole of this animal was effected with pleuro-pneumonia, it would do any harm to any human being. He submitted to the Court that they were shut up by the evidence to this conclusion that, though the lung was diseased, the flesh was wholesome and sound. He reminded the Court that it was twenty years since the inspector had been a butcher, and he had not got those qualifications in his past history which would lead an ordinary mortal to suppose that he was remarkably well-fitted for his post. Besides, he had only made a cursory examination of the animal, and his testimony could not be set against the elaborate and careful examination made by the witnesses for the defence. Professor Gamgee stated his opinion in a broad, general way, but he had stated no grounds for his opinion. He merely made a vague, strong assertion that this must be so because he thought so. He submitted that, after the evidence which had been given by Professor Gamgee before the Committee of the House of Commons, he was entitled to say that his evidence on this subject was not to be relied upon unless it was confirmed, or unless he gave very satisfactory reasons for the conclusions which he had formed. Then Dr Littlejohn's evidence was fairly open to the remark that his position required that he should deal very strictly with such cases, and that his impressions were naturally rather biassed in favour of strictness in dealing with such matters as these, and rather against generosity. Mr Thomson proceeded to notice the evidence which he had led for the defence, directing attention to the fact that he had adduced four experienced practical men, and four experienced scientific men, all of whom concurred in saying that this meat was good meat. They had against their testimony the evidence of Dr Littlejohn, the public Officer of Health, and Mr Gamgee; and he asked which scale was to kick the beam? Were they to take the two and put them against the eight, especially when they were such a two? The Court must judge by the evidence, and by nothing else; and that being the case, he had the most perfect confidence in the result, because this was not a question of balancing of evidence, but of abundance of evidence on the one side and not a vestige of it on the other.

Bailie ALEXANDER intimated that he would give his decision on Tuesday next, when the remaining cases would also be disposed of.

---

ON Wednesday, November 9, Peter Gardiner, dairyman, Union Street, was brought up at the bar of the Burgh Court, before Bailie Alexander, charged with having in the Slaughter-Houses, on the 29th October last, the carcasses or part of the carcasses of two cows, unsound, unwholesome, and unmarketable.

Mr Dymock, Burgh Fiscal, conducted the prosecution, and the accused was defended by Mr J. Comrie Thomson, advocate. The Court was crowded.

Andrew Somerville, gatekeeper of the Slaughter-Houses, was the first witness for the prosecution. He deponed—I was at the gate on the night of Friday the 28th October, when Mr Gardiner came with two cows. He said they were both diseased, but one was not so far gone as the other. I entered them in the apparently diseased book.

Cross-examined by Mr COMRIE THOMSON—Mr Gardiner did not say the animals had got a touch of pleura.

Re-examined—I easily saw that both animals were diseased. I have been twelve and a-half years gatekeeper.

Robert Wilson, Inspector of Markets, deponed—I have been a flesher for upwards of twenty years. My brother-in-law was a large dealer in butcher meat, and I was his foreman. Many thousand carcasses passed through my hands. I also dealt for myself. From that experience I can at once tell what meat is unfit for human food. On becoming a farmer I reared all kinds of stock. I have had large experience of the disease in cattle. I have lost L.500 on my own account by disease in cattle. On the 29th October I examined the cattle belonging to Mr Gardiner. They were both bad, but one was worse than the other. I saw the left lung, which was sound. I did not see the right lung; but I think it must have been bad from the appearance of the beef. The midriff showed symptoms of disease. I showed the cows to Mr Reid, veterinary surgeon. One of the cows was diseased, unsound, and not fit to be exposed for sale. I cut part of the flesh, and it quite confirmed the opinion I had formed. I saw both the lungs of the other animal. Its right lung was very much affected. If such cows are allowed to pass, there is no need of an inspector. I think these animals had both been brought to the Slaughter-House to save them the trouble of dying. (Laughter.)

Cross-examined by Mr THOMSON—I can't tell who took away the lung of the first-mentioned cow. I made inquiry, but could not find out. I found a yellowish matter on the right side of the midriff. The flesh had a dark appearance, and was sticky and inclining to wet. The disease was all on the right side. The inside of the ribs was all diseased. I saw that the ribs had been scraped. The ribs are scraped for deception. I have done it myself hundreds of times. (Laughter.) Interrogated—Were there any animals in the Slaughter-House that day which had been passed, and had also been scraped in the ribs?—I am not prepared to answer that question. I condemn animals because they are diseased; but as I am not a medical man, I can't tell what effect the eating of that kind of meat might have. I would not condemn an animal in the first stage of disease. I saw by the appearance of the first animal that the lung had been putrid. The flesh was in a very bad state. I think I can judge of a diseased animal better than any doctor. I went to Dumfriesshire about eighteen years ago. I had a farm there. There was a good deal of opposition to my appointment. Interrogated—Was Mr Gamgee your best friend?—I never saw the man. I am not aware whether he opposed my appointment.

Re-examined—For deception, cattle are scraped underneath the midriff.

By the COURT—I have no hesitation in saying that the bad state of the right side of one of the animals was produced by disease in the lung.

Alexander Craigie, flesher, 56 High Street, deponed—I killed Mr Gardiner's cows. One lung of each animal was diseased. The lungs were left lying in the booth.

Cross-examined—Wilson did not ask me for the lungs that were amissing.

Re-examined—I don't know that Wilson was aware that I had killed the animals.

By Mr THOMSON—I never saw a regulation in the Slaughter-House to the effect that the lungs of suspected animals should be kept till seen by the inspector.

Robert Reid, veterinary-surgeon—I have been four years a veterinary-surgeon, and have examined a good number of diseased animals. I am sub-superintendent of the Slaughter-Houses. I examined Mr Gardiner's two cows.



I examined the inside of one of them, and found bloody serum oozing out. The anterior part of the diaphragm was diseased. When I looked at the animal two days after it looked rather better. I think it was unfit for the market. The other one was not so bad ; but it was unsound, diseased, and unfit for the market.

Cross-examined.—I consider it my duty to condemn every animal that is suffering to any extent from pleuro-pneumonia.

Dr Littlejohn—I examined Mr Gardiner's animals. For the last ten years I have examined almost every animal that has been condemned in Edinburgh. A single glance at one of Mr Gardiner's animals would have shown that it had been extensively diseased. On looking at the diaphragm on both sides it was wet, but the midriff had been stripped—that is to say, the pleura had been removed. I am well acquainted with the pathological appearances in the human body, and without such experience as I have had during the last ten years I would be perfectly helpless in giving an opinion regarding the cattle of Mr Gardiner. I did not consider it necessary to subject these animals to microscopic examination, as it would have been a mere case of scientific trifling. I think it is a piece of bravado for a man to say he would eat a steak off a diseased cow. As to the second cow, its organs had been entirely removed. The flesh presented the same appearance as that of the first animal.

Cross examined—I heard the medical evidence on Saturday. There are not changes in colour of the muscle in such a case as this under the microscope. There is no change in colour produced in rapid death from pleuro-pneumonia. There is a variety in the colour of the muscle of various animals. The richer the colour of an animal, the firmer the consistence. The muscle in this case was not bleached or macerated. The changes on muscles, arising from the effects of innutrition, are deposits of fat. I do not consider an ordinary market inspector is able to detect pleuro-pneumonia in its first stage ; only a scientific man can detect that. I know of carbuncle having been very prevalent in Edinburgh, but no person can say what it arose from. I do not know of any case of carbuncle arising from the consumption of diseased meat. I have not seen more than twenty cases of carbuncle. I recollect the prevalence of dysentery in Millbank Penitentiary. Dr Baily ascribed that to want of nourishment and the absence of butcher-meat. I have no doubt the poorer classes would be better without butcher-meat at all than such as that of the two cattle of Mr Gardiner. I think the health of the poorer classes in this town would be vastly improved by their being deprived of pleuro-pneumonia beef. If they took oatmeal, milk, and potatoes, they would be far better than they were by eating impoverished butcher-meat.

Professor Gamgee deponed—I found one of the carcasses had died of pleura. One of them had extensive adhesions on the right side, and there was inflammatory redness on the surface of the ribs and intercostal muscles. The pleura had been stripped from the midriff and ribs on the right side of the animal. The diaphragm of both was of a soft condition. The fat was of a bluish colour, and the flesh was dark-coloured and sticky. I regarded the carcasses as those of diseased animals, which were unsound and unmarketable.

Cross-examined—I accept it as a fact that diseased animals are deleterious to the consumer. In the earlier stages of pleuro-pneumonia I think the beef is innocuous. The microscope could not be of the least use in examining the muscles in cases of pleuro-pneumonia. Occasionally the flesh that looks most beautiful is bad, for the appearances are often very deceptive ; therefore great caution is required in the inspection. Defective nutrition makes the muscle pallid and thin. Mr Wilson, the new inspector, is a far more useful man than I thought he would be, and I am, therefore, agreeably disappointed. My opinion of Mr Wilson is, that so far as a non-professional person is concerned, the Council could not have appointed a better inspector. It is my opinion that not a pig should be slaughtered without being microscopically examined. This is done in some parts on the continent, and it will come to be the case here. I



know a memorial was got up, asking the appointment of a scientific man as inspector. I know Dr Maclagan and other medical men took an interest in getting up that memorial.

Mr THOMSON having gone at considerable length in the cross-examination of Dr Littlejohn and Professor Gamgee as to the effects of the consumption of pleuro-pneumonia beef,

Bailie ALEXANDER interrupted him, and said that he did not intend to pay any attention to such evidence; all that he wanted was evidence as to the unsoundness or unwholesomeness of the two carcasses in question.

Mr THOMSON said he intended to go over the same line of evidence with the whole of his witnesses, but he would endeavour to be as brief as possible.

The cross-examination of Mr Gamgee was then proceeded with as follows:—It is my opinion that the consumption of pleuro-pneumonia beef produces carbuncle. I cannot tell how many cases of carbuncle I have seen. I cannot say whether the want of animal food produces diarrhoea and dysentery. I think animal food is necessary to a hard-working population, and I think the absence of animal food is injurious. I believe the richer classes eat as much diseased meat as the poorer classes. They pay a higher price for it, and are thus defrauded. Good cooking would greatly prevent deleterious effects; but I consider that the magistrates of this or other cities have to prevent the sale of diseased meat rather than to attend to the way in which people cook their food.

The Court adjourned at half-past two o'clock till to-day at twelve, when Bailie ALEXANDER will give his decision in the case which was tried on Saturday, after which the evidence in Gardiner's case will be resumed.

---

#### CONVICTION OF THE ACCUSED.

ON Thursday, November 10, the trial of the adjourned case of Gardiner, charged with having in his possession and in Slaughter-Houses the carcasses of two cows which were unsound, unwholesome, and unmarketable, was resumed in the Burgh Court before Bailie Alexander. Mr Dymock appeared for the prosecution, and Mr J. Comrie Thomson for the defence. There was again a large attendance in the Court, the cases having excited considerable public interest.

Dr Alexander Wood was first called and examined for the defence by Mr THOMSON. He deponed that he had examined the cows in the Slaughter-Houses, and he considered that the flesh was perfectly sound and wholesome, and quite fit for human food. There had been traces of inflammation of the pleura, but there was no trace of any disease whatever having extended to the flesh. There were three ways in which the flesh might be affected. In the first place, there might be simple inflammation of the pleura, which had no effect whatever on the flesh unless it went on to gangrene; in the second place, there might be a specific inflammation of the pleura which might extend to the flesh, and that was not proved in this case; or, in the third place, the blood might be poisoned, in which case inflammation of the pleura was merely a local manifestation, but there was no evidence that the disease in this case was of that character. He had occasion to inquire into the literature of this subject, with the view of seeing whether disease had been caused in the human subject by the eating of pleuro-pneumonia food, and the result of his inquiry was, that there was no well-authenticated case of any disease in the human subject having been produced by eating the flesh of animals which had been affected with pleuro-pneumonia, when the disease of pleuro-pneumonia was in its earlier stage. He might refer to the evidence of the Inspector of the Markets in Leeds upon this subject. The markets in Leeds were differently managed from the markets in Edinburgh. There every encouragement was given to send in diseased cattle into the market, and they were slaughtered, and the inspector decided; or, if he had any difficulty, he called in the aid of two butchers and two medical men to decide whether the



flesh of the pleuro-pneumonic cows was fit for eating. Dr Wood proceeded to read the evidence of Mr Higgins before the Committee of the House of Commons, which was to the effect that in Leeds the medical men and the butchers who were called in to examine the carcasses of the animals slaughtered, when affected with pleuro-pneumonia, decided that a large proportion of these carcasses were quite fit for human food. He (Dr Wood) was of opinion that if Mr Gamgee's calculations were correct that one-fifth of the whole animals slaughtered were affected with pleuro-pneumonia, on the supposition that disease followed the eating of the flesh of those animals, they would not have to search the country for isolated cases of disease. Carbuncle was a very rare disease. He had a pretty extensive practice, and he had only seen two cases of carbuncle during the last three years. He had not seen a single case of carbuncle resulting from the eating of pleuro-pneumonic food. The idea that carbuncle was caused by eating pleuro-pneumonic food originated in a statement made by Dr Livingstone in his account of his travels in Africa; but he was of opinion that the passage in Dr Livingstone's book afforded no good ground for the belief. Dr Wood here read the passage in Dr Livingstone's book which referred to "malignant carbuncle," and said he was of opinion that the disease termed "malignant carbuncle" by Dr Livingstone was not the disease known by the name of carbuncle in this country. In this country malignant carbuncle was not known except as an attendant on the plague. There was a later stage of pleuro-pneumonia in which he would reject the animal as unfit for human food, and his object in examining the carcase of this animal was to examine whether the dangerous state had been arrived at. The only methods of examining tissues known to scientific men were by the eye and by the microscope. The microscope frequently reveals morbid conditions of tissue which the eye fails to observe. No scientific man would call it trifling to use the microscope to examine whether the flesh of animals was diseased. He had heard it called trifling by flippant people who are ignorant of the uses of the microscope; but he had never heard a scientific man say so. Diarrhœa and dysentery were common diseases among the poor, because of improper diet, and the absence of sufficient animal food. He would not be there as a witness were it not that he felt it would be the greatest calamity that could befall the poorer classes of the city if every carcase affected with pleuro-pneumonia were to be condemned. It would raise the price of meat so much that it would be unattainable by the lower classes, and then the diseases that were produced by the absence of butcher-meat would be found to prevail. It was very decidedly his opinion, that it was much more likely to be injurious to the health of the poor, if the course followed by the Inspector in this case were to be continued, than if the trade were to be allowed to go on in their own way.

Cross-examined by Mr Dymock—I should not like to eat a dog—I never tried it. I do not see why the flesh of a dog should not be wholesome. I dare say we have often had cats given us to eat. (Laughter.) I am sure that I have had cats given to me in Paris. (Renewed laughter.) I have had hare-soup in which the meat had a most suspicious resemblance to cats. I don't like that, especially when you pay for the cats as hares. (Laughter.) By the word wholesome, I mean food that will nourish the body, and will not be poisonous to it. I am aware that the word comes from "halesome." I am not prepared to pronounce an opinion as to whether this disease of pleuro-pneumonia is infectious. I think that is a very doubtful question. There is no more difficult question in medical science than the origin of disease. It depends entirely upon the nature of the disease, and how far it has extended, whether an animal attacked with disease is a wholesome animal. A man affected with lung disease is not a wholesome man, but his flesh may be sound. If I break my leg I may not be sound in that part of the body, but the other parts of my body may be sound—I mean perfectly free from disease. I wonder if ever there was a perfect carcase, or a perfect anything else. If I had a horse labouring under pleuro-pneumonia I would certainly consider its lungs unsound. Soundness in



a horse is different from soundness in a cow, for this reason, that a horse has to do one kind of work and a cow has to do another kind of work. A horse has to draw vehicles, and if its lung is affected, cannot draw a carriage; a cow is an animal that has to go into the mouth and intestines to nourish the body, and if a part of it is sound, the sound part will nourish the body. If the lungs are affected, I would not propose that the lungs should be eaten.

By Mr THOMSON—It is my decided opinion that those parts of the animals in this case that I saw hanging up were not unwholesome, unsound, and unmarketable.

By Bailie ALEXANDER—It is my decided opinion that the flesh of animals in an early stage of pleuro-pneumonia is quite sound and wholesome.

By Mr DYMCK—The flesh of animals in the early stage of pleuro-pneumonia may not be equally nutritious with animals entirely free from disease, but it is not unwholesome. Poison cannot be detected in the muscles if the disease is in its earlier stages.

Bailie ALEXANDER—When does the early stage of disease end during which the flesh continues wholesome?

Mr THOMSON—I submit that that is not a matter of evidence, but of argument. My case is, that there is a stage of the disease at which the flesh becomes unwholesome, but that is an advanced stage; and the evidence has tended to show as nearly as possible what inquiries are necessary in order to mark that stage. The question for you to decide is, whether the witnesses for the complainer, who maintain that that stage had been reached, or the witnesses for the respondent, who maintain the opposite view, are most to be relied upon; and I will venture to show that better means have been taken by the respondent's witnesses for arriving at the truth than by the witnesses for the complainer.

Bailie ALEXANDER—Well, but I wish Dr Wood to answer my question at what time the early stage of the disease terminates.

Dr Wood—I cannot tell you; but if you show me the flesh I will tell you whether it is affected. If I had heard that the lungs were gangrenous, I would not say that the flesh was wholesome.

By Mr DYMCK—Would you recommend that food of this description should be regularly supplied to the Royal Infirmary, and other public institutions in the city?—I will not answer that question directly; but I do not see any objection to meat that is fit for human food being taken anywhere. I have no objection to its going to the Infirmary or anywhere.

Dr Grainger Stewart deponed that he had examined the carcasses of the two cows in question; that he had used the microscope in his examination; and that he considered the flesh was quite sound, wholesome and marketable. He considered that in the early stage of pleuro-pneumonia the flesh was not affected.

By Mr DYMCK—By the word wholesome I mean tending to promote health. One part of the body may not be, and the rest perfectly sound. If I were to burn my right hand, my right hand would be unsound, but the rest of my body might be perfectly sound.

By Bailie ALEXANDER—I have never examined the flesh of animals for the purpose of detecting disease in them. It would depend entirely on the extent of the disease whether the flesh of an animal with diseased lungs would be in a healthy state. I would judge of each case according to the appearance of the carcase, and if I found it in my opinion quite healthy, I would say so.

By Mr THOMSON—In certain stages of the disease the carcase would be affected, In the present case the state of the carcase shows that the diseased state of the lungs had not affected the soundness of the carcase.

By Bailie ALEXANDER—In both of the carcasses there had been a scraping away of pleura. I could not detect animal poison in the flesh of animals either by the eye or the microscope. I did not say that the flesh of these animals is free from poison; and I could not say so from an inspection of the flesh,



any more than I could say by inspecting the flesh of an individual who had been poisoned by opium, that I could detect the poison.

Bailie ALEXANDER—Then you cannot state positively that the flesh of animals labouring under pleuro-pneumonia is free from poison, and therefore safe to be eaten?

Dr Stewart—I can say that it presents no morbid appearance at all.

Bailie ALEXANDER—The question I put to you is this. It is alleged that the flesh of animals labouring under that disease is dangerous to be eaten, and that the danger arises from its being poisonous. Now, you say you cannot detect poison in the flesh, either by the microscope or by the eye; therefore you cannot pronounce an opinion as to whether it is safe to be eaten?

Dr Stewart—But you will observe you say “it is alleged.”

Bailie ALEXANDER—There is no allegation about it.

Dr Stewart—I thought you said so.

Mr THOMSON—The allegation is in the complaint. I do not suppose any animal poison could positively be detected?

Dr Stewart—No.

Mr THOMSON—Therefore every stot or cow killed in the market may be poisoned, for all that may be known?

Dr Stewart—Yes.

Bailie ALEXANDER—You are going too far, Mr Thomson. The question here relates to a particular disease. There is an allegation made that the flesh of animals labouring under a particular disease is poisonous in respect of the disease.

Mr THOMSON—But the witness does not speak of any particular poison. The animal may have been poisoned by opium, or in a hundred different ways.

Bailie ALEXANDER—Where was the animal to get the opium? (Laughter.)

Mr THOMSON—Don't let us have any misunderstanding here. You asked the witness whether it was possible to detect poison in flesh?

Bailie ALEXANDER—No; the question I put to the witness was, “Could he detect the poison which was alleged to exist in animals labouring under pleuro-pneumonia?”

Mr THOMSON (addressing the witness)—Do you think it possible to detect whether the tissue of these animals was such as would poison the consumer or not?

Dr Stewart—There is not the slightest ground for thinking that it would do so from the examination that I made.

By Bailie ALEXANDER—You are aware that it is a prevalent opinion among some medical men that bad smells are not deleterious to health?

Dr Stewart—I have heard one excellent authority at least say, that a bad smell would not necessarily produce a fever.

By Mr THOMSON—That is a perfectly correct assertion. There is no necessary connection between a bad smell and fever. That is the opinion of the whole medical profession.

William Thyne, butcher, Stockbridge, gave evidence to the effect that he had examined the carcasses of the cows in question, and considered them perfectly sound, wholesome, and marketable.

Mr Ramsay, Superintendent of Slaughter-Houses, deponed—The meat of the two cows in dispute was firm, and of a clear natural colour when I examined it. I have seen such animals used for food. Mr Dickson and I have passed such carcasses very often, and I have never known ill effects result from it. We don't pass the animals when the disease has gone beyond a certain length. There was a question about the condemnation of an ox this morning. Mr Wilson inspected the carcase of that ox this morning at eight o'clock, and pronounced it good beef; now that ox is perfectly putrid and stinking between the shoulders. I would condemn the animal at once. Down at the shoulder it is quite green and stinking. Mr Wilson passed it. Mr Dickson condemned it, and entered his condemnation in his book of visits.

Bailie ALEXANDER—Do you remember my putting a question to you, when you were here before, as to whether you permitted the lungs of a healthy animal to be carried into the Slaughter-House and represented to Mr Wilson as the lungs of an animal which was really diseased?

Mr Ramsay—I answered that question on Saturday.

Bailie ALEXANDER—I then asked you why you were guilty of such a thing, and the answer you gave me was, that you had no jurisdiction in the matter, because your superior was present. What explanation have you to give now for interfering in this case, when you did not see it to be your duty to interfere in one of the grossest cases of deception that could be perpetrated by a public officer?

Mr THOMSON—I am not aware that there is anything said about his interference. It is an interference on my part, and not on his.

Bailie ALEXANDER—With all deference, Mr Ramsay stated to me that he had allowed the grossest act of deception to be perpetrated which I ever heard of, on the part of a public officer, and the answer which he gave was, that he considered his jurisdiction at an end.

Mr THOMSON—That is very bad; but I do not see how that reflects upon his conduct here.

Bailie ALEXANDER—It reflects to this extent, that I cannot shut my eyes to this fact, that it must have been for the purpose of injuring Mr Wilson, our present inspector.

Mr THOMSON—I don't see it in that light.

Bailie ALEXANDER—You brought it out by putting this man in the witness box.

Mr THOMSON—I am simply endeavouring to show that Mr Wilson's evidence with regard to these cows is not very reliable; and also with the view of showing that this man Ramsay, who is represented to have passed every bit of meat that was sent to the Slaughter-Houses, is to be credited.

Bailie ALEXANDER—It will be time enough to speak of that new case when it is brought here; but I do not think you can ask me to attach the slightest credibility to a witness who will make the admissions which this witness has done.

Mr THOMSON—I am only leading this evidence as to credibility and capability.

Bailie ALEXANDER—This new case should not have been brought here at this time.

Mr THOMSON—I submit that it is quite relevant with the view of affording evidence as to credibility. I maintain that it is relevant, for this reason—the first witness examined by the Procurator-Fiscal is Wilson, and he is examined because of his experience and knowledge of diseased cattle. I put this witness into the box—who is open to any observations as to his past history or present position, but who proves that the witness whose skill is relied on by the Procurator-Fiscal passed an animal in a state of putridity——

Bailie ALEXANDER—I cannot allow an argument such as this to be carried on. It is quite out of order. I say distinctly that you cannot ask me to disbelieve the evidence of one witness by the evidence of a man who is guilty of such an offence as this witness has admitted. I have no other authority than Mr Ramsay, and you have no right to bring Mr Ramsay forward in this way, as I cannot permit it.

Mr THOMSON—I am sorry I cannot see it in that light, for I think the evidence quite relevant. You will kindly note that you disallow this evidence, and initial the note.

Bailie ALEXANDER—Yes.

Professor Dick was next examined by Mr THOMSON—I examined the carcasses of the cows in question, and I considered them wholesome, sound, and marketable. I examined them carefully into the ribs. There is a stage of pleuropneumonia when the lung becomes mortified, that the flesh becomes unfit for human food, but in the early stage of the disease the flesh is quite fit for human



food. When I stated on Saturday that I was quite willing to eat a steak off the animal then in question, I meant that I was quite willing to eat the animal myself, or to let anybody else eat it. It was not at all an exaggeration, nor a bit of bravado. It was seriously intended, to show what was my opinion of the meat.

Mr Strangeways, Professor of the Veterinary College, was the next witness. He deponed—I examined the carcasses of the two cows in question, and I consider them perfectly wholesome, sound, and marketable. I have no hesitation in saying, that if they were used for food they would produce no bad effects. There is a stage of pleuro-pneumonia in which the flesh of the animal is bad for food—the last stage; but the tissue at that stage presents well-marked symptoms. In the advanced stage of pleuro-pneumonia, the flesh becomes very soft, flaccid, and wet.

By Bailie ALEXANDER—I could eat a beefsteak off the carcasses. I was wishing very much, when I was waiting in the side-room, for a beefsteak off one of them. (Laughter.) I would have no objections to be fed on that sort of meat for a month or six weeks. I do not consider it diseased meat. I do not consider the flesh of any of these cows diseased meat. I examined the ribs carefully inside, and they had the appearance as if part of the pleura had been removed.

By Mr THOMSON—Do you think it would do any harm to a man to eat steaks off such cows for a twelvemonth? I would not object to live my whole life on the flesh of such cows. I have no hesitation in saying that I have eaten the flesh of such cows for months and not known of it.

Bailie ALEXANDER—But some persons have strange tastes.

By Mr THOMSON—It is my opinion that there is no medical proof that the eating of such animals has ever done harm.

Bailie ALEXANDER—That is very difficult to get, you know.

Mr THOMSON—We must leave it to the other side to get it.

Mr THOMSON then intimated that he wished to put Mr Swan into the witness-box to ask him as to the ox referred to by Mr Ramsay in his evidence.

Bailie ALEXANDER ruled that such evidence could not be received, on the ground that it was irrelevant.

It was then agreed to hold the evidence given by Mr Swan and Mr Snow on Saturday last in Mr Robb's case as repeated, and this closed the evidence for the defence.

Mr DYMCK proceeded to address the Court for the prosecution. He said—The first observation I have to make is, that those prosecutions have been brought without any reference to the general question as to the wholesomeness of pleuro-pneumonic beef. They have been brought on account of a complaint lodged with me by the superintendent, Mr Ramsay, that the special carcasses in question had reached that stage of disease as to be unsound. In these circumstances, I had no alternative but to bring the matter before the Court. The complaints are laid upon a local act for the city; one main object of which is to secure the citizens, especially the poorer citizens, against improper animal food. By that act a superintendent is ordered to be appointed for the special duty of seeing to this, and it is my province to protect him in the discharge of it. It gives me great pleasure that these cases have undergone the rigid scrutiny they have done. All that I have desired is the truth, and nothing but the truth; and although many of the questions, and the general course of examination on the other side have been, in my opinion, very irrelevant, I have made no objection to any one question or any one remark for the defence. Perhaps I may have erred a little on the other side. I have allowed the witnesses for the prosecution to be tested and sifted, and even abused in a way very uncommon. But they have well stood the test. The great main facts of the case stand unimpeached—that, in the plain common-sense meaning of the words unwholesome, unsound, and unmarketable, the carcasses in question are decidedly so. And it is certainly very gratifying to me to think that Dr Wood



and the other witnesses for the defence are about the best witnesses for the prosecution. I will not trouble your honour with going over the evidence in detail. The defender himself brought these animals to the gate, admitting that they were diseased, or, in other words, unsound; the gate-keeper, whose experience extends over twelve years, saw they were so; Mr Ramsay ticketed them as requiring inspection; the inspector, whose experience is very great, and whose intelligence must have been apparent to all who heard his examination, confirmed the defender's own supposition. He again was amply confirmed by Dr Littlejohn, whose opinions in such matters for long years past—since ever he was known in fact—have never been gainsayed. And he, again, has been amply borne out by Professor Gamgee—a gentleman who, notwithstanding all that has been said against him on the other side, maintains a position for talent and experience entitling him to the thorough confidence of the Court. All of these are thoroughly backed by the dictum of Dr Stark, whose word I may say is law. I make no comment on the evidence for the defence. I don't think that it has touched the case at all, except in so far as it has been favourable to the prosecution. And I therefore leave the case with entire confidence in the hands of your honour. Permit me to say, in conclusion, that I hold this traffic in diseased meat as a most nefarious traffic. The legislature has done all in its power in this act to put a stop to it in this city, and I am happy that I have been spared to this day to give my feeble efforts to its suppression. Having said thus much, I have only to add, that as these are the first cases which have happened under our new inspector, should your honour be of the same opinion, I think that the interest of the public will be sufficiently protected by the forfeiture of the carcasses without the infliction of any pecuniary penalty.

Mr THOMSON then addressed the Bench for the defence. The case, he said, as it had gone on, had presented itself in a much more serious light to his mind than it did at first; and it seemed to him that the question involved was one of very considerable importance. It was not, however, of such vital importance as Mr Dymock's last observations would lead them to believe, because they were not dealing with the traffic in diseased meat. They were dealing with a contravention of a special Act of Parliament which was to prevent or put difficulties in the way of such traffic. They were not there trying a scoundrel who was attempting to palm off bad meat upon poor people, so he hoped his Honour would not consider the case as if he had a rascally butcher before him who did not care whether he poisoned his customers or not. He did not think his clients could complain of any improper or undue advantage having been taken by the Fiscal, and that gentleman had made a proper and generous conclusion when he departed from the penalty. Still the case remained a most serious one for his clients. There was one question for the Judge to affirm or disallow, and only one question, and that question was whether the three words, unwholesome, unsound, and unmarketable, used in the 9th section of the Act, had been proved to apply to the carcasses in the two charges in question. It might be all very well for the Fiscal to bring evidence as to the meaning of the word "sound," but the Judge should read this section of the statute in the light of the whole enactment, and in the light of a number of clauses, and he defied him to come to any other conclusion than that these words were used as synonymous with unfit for human food. That was the real interpretation of these three words, and if these carcasses were proved to be such, he prayed for a conviction. But unless the proof came up to this, that the carcasses were unfit for human food in the sense of being innutritious and positively deleterious, then there could not be a conviction. He admitted that there were some stages of the disease of pleuro-pneumonia which rendered the flesh unfit for human food, and that the meat should be seized. Therefore the true issue of these cases was whether these animals were so afflicted at all. He thought it was proved that both of Gardiner's cows were suffering to a certain extent from pleuro-pneumonia. Then came the question to the solution of which the whole of his evidence



had been directed, and which was truly the question on which the decision must depend—Had the animals reached that stage of disease which rendered their carcasses unfit for human food? If the Magistrate thought that stage was reached, then he should convict; but he (Mr Thomson) thought it had been proved beyond a doubt that the animals had not reached that stage at all. Mr Thomson went on to argue that the question ought to be decided by the evidence of medical and practical men. Such men had been adduced on both sides, and there had been a conflict of evidence on the point at issue—one side of witnesses maintaining that the flesh was bad and unsound, and the other as distinctly stating that it was sound. But he held there was an overwhelming weight of testimony in favour of the soundness of the meat. Regarding the evidence for the Crown, the testimony of Dr Littlejohn and Mr Gamgee was decidedly contradictory on certain important points of the case. As to the inspector, Mr Wilson, he did not think he was a competent person to judge of the question they had to decide. Regarding the microscope, the use of which Dr Littlejohn considered would be “scientific trifling,” they had had medical evidence to the effect that the only proper means of arriving at a conclusion on the subject was by using the microscope. He submitted, therefore, that it had not been proved by the Fiscal that the meat had been diseased. He could not doubt that the Court would let Dr Littlejohn’s and Mr Gamgee’s evidence go to the wall, and decide in accordance with that of Drs Wood and Stewart. Further, as to the conflicting testimony of Dr Littlejohn and Mr Gamgee, Dr Littlejohn said he had never seen one case in which disease in man followed the consumption of such pleuro-pneumonic beef in all his experience. On the other hand, Mr Gamgee told them that he had often seen disease in man follow the consumption of such animals, but he could not give one instance of it. He also asked Mr Gamgee what forms of disease followed the eating of such beef, and he answered “carbuncle and diarrhoea.” He asked Drs Littlejohn and Wood about carbuncle, and they said it was a very rare disease. But Mr Gamgee said it was not a rare disease—that he had often seen it; and when pressed by himself to give some instances, Mr Gamgee referred to the savages of South Africa, as mentioned by Dr Livingstone—a reference which had been disposed of effectually by Dr Wood. Mr Gamgee throughout his evidence dealt in generalities. He (Mr Thomson) did his best to bring him to book on some of his theories, but he had always bolted away into a lecture as if he were in a class-room. As to the whole evidence, they had consistency of statement on the part of eight witnesses picked from all classes of people likely to know about the matter, who said that the meat was not unfit for human food; therefore he placed that evidence against the very inconsistent groundless testimony of witnesses whose antecedents rather suggested that their statements should be taken *cum nota*. The whole of this question regarding the flesh of animals slightly touched with pleuro-pneumonia, raised on account of the excitement created by Mr Gamgee, caused an inquiry to be made into the subject by a Committee of the House of Commons last summer. The question discussed that day was most fully discussed by that Committee. In that Committee Mr Gamgee was not exposed to what he considered, or what he appeared to consider, the unfair and torturing ordeal of counsel asking questions. He was asked by the members of that Committee, gentlemen who had no interest in the matter except to arrive at the truth, questions which exposed the strong and foundationless statement he had made. Thus the result of the whole inquiry which Mr Gamgee introduced for the purpose of procuring an Act, was that the bill was unanimously dismissed by the House of Commons, because the whole affair was found to be a perfect bugbear, and the sensation about pleuro-pneumonic beef was found to be absurd, and to have no foundation except in Mr Gamgee’s over-fertile brain. There was probably too much looseness in the market. He believed that under the system which formerly prevailed, there were sometimes cattle sold in the market that should not have been sold, and that was one thing the authorities should take precautions to prevent. There had been an extreme of laxity, but they all



knew how apt people were, in avoiding one extreme, to diverge to the opposite extreme, which was equally injurious and equally pernicious. There was surely in these cases an extreme of rigour, and he called upon Bailie Alexander, as a magistrate, to say that he would give no countenance to such rigorous proceedings. The Judge in such cases must take care not only that his clients were not to be mulcted in penalties—not only that the butchers' trade was not put to serious inconvenience, but he must take care that by his judgment he did not prevent the poor, needy, moneyless people of this city from getting that kind of food which it had been sworn was essential to their health. (Applause.)

Bailie ALEXANDER then proceeded to give judgment in the case of Mr Robb, the evidence in which was led on Saturday, and reported in Monday's *Scotsman*. He said this was a most important case both as regarded the interests of the public and the defender at the bar; and he had given the whole evidence both for and against the defender his most anxious consideration. It had been admitted that pleura did exist in the animal in question; and the defence set up was that it did not exist to such an extent as to render the flesh either unwholesome or unmarketable, and several witnesses had been examined to establish this point. They, however, all agreed in stating that when the disease has reached a certain point, then the flesh becomes unmarketable and unfit for human food. He had endeavoured, by cross-examination, to elicit from these witnesses at what particular stage this occurred, but none of them had been able to give him precise information on that point; all that he could gather from them was, that it was when the meat becomes dry and clammy. The counsel for the defence had argued that Mr Wilson was unfit for the office of inspector, because he had only been an apprentice and journeyman butcher. But he (Bailie Alexander) was satisfied in his own mind that such men were quite as competent to judge as the masters, and some of them a great deal more so. And it had been argued that any little knowledge he had got in these capacities must have been forgotten by him while he was in Dumfries. In proof of the qualifications of Mr Wilson, he had only to read the testimonial of Mr Thyne, one of the witnesses for the defence, which stated that he was a man of long experience and great ability, and was well qualified for the office. And when most of the respectable butchers in Edinburgh had given similar testimony, he thought the Town Council was amply justified in appointing Mr Wilson. As to the remarks made by Mr Thomson regarding Mr Gamgee, he (Bailie Alexander) was quite satisfied that whatever appearance that gentleman made in the House of Commons, no one who had heard his evidence in the two cases which had been just tried, could apply to it the term harsh, or anything like it. He had given his evidence in a clear and candid way, so far as he (Bailie Alexander) was able to judge. He might say the same thing of Dr Littlejohn, whose vast experience made him a most competent judge in such matters. Therefore, with all deference, he must say that the evidence for the prosecution had the preponderance, and he could come to no other conclusion than find Mr Robb guilty in terms of the Act. In consideration of what had fallen from the Fiscal, he was inclined not to inflict a penalty in this case, as this was the first under the Act; but at the same time he hoped the leniency shown on this occasion would be a warning to others not to follow Mr Robb's example, for they would be dealt with in a very different manner. He therefore found the charge proved, and ordered the confiscation of the carcase.

A similar decision was given in the case of Peter Gardiner.



## PERISCOPE.

—o—

## REPORT OF CATTLE DISEASE IN INDIA.

*(Continued from p. 702.)**(From Proceedings of the Madras Government, Revenue Department, 27th October 1863.)*

Read the following Letter from the Collector of Kurnool, dated 17th May 1864,  
No. 78 :—

1. I have the pleasure to forward a report, drawn up by Veterinary Surgeon Thacker, on the result of his visit to this district, to investigate the cattle murrain, which, from the papers circulated on the subject, appears to be prevalent in all parts of India.

2. It is not necessary for me to recapitulate what will be found detailed in Mr Thacker's report. The personal interest which I felt in his inquiry, and the knowledge that my presence might very possibly be necessary to give that authority to his proceedings which would be requisite for success, made me desirous of accompanying Mr Thacker throughout his inquiries, a wish which I was unable to carry out, owing to the order of Government placing me in temporary charge of the Bellary District. Before leaving Mr Thacker, I had the satisfaction of knowing that he was settled in the village of Ravypad, where cattle murrain was raging, and where he would have the fullest opportunity of testing his proposed treatment, and thoroughly investigating the disease.

3. The result of the full experience gained by Mr Thacker at this most favourable opportunity is more encouraging than was to be expected : seventy-five per cent. of all the cases treated were cured ; and there seems no room to doubt that the disease is amenable to treatment, and that by proper measures its ravages can be very greatly checked.

4. The mode of treatment recommended by Mr Thacker, and a clear account of the symptoms of the diseased, forms an appendix to his report. This paper will be translated into Teloo-goo, and published as speedily as possible in the district gazette. I also propose to strike off separate copies of the paper in Teloo-goo, for sale to the Ryots at one anna. These instructions can in the same way be published in all the district gazettes of the Presidency, and thus be made generally available. The collected papers on the subject show not only that the disease is universal, but also that no rational treatment has yet been anywhere attempted.

5. While improved medical practice should greatly reduce the percentage of mortality amongst cattle attacked with the disease, it is to remedial measures in lessening the risks of contagion that Mr Thacker looks chiefly for reducing the losses now occasioned by the epidemic. It is quite certain that nothing short of compulsion by a penal enactment can enforce the adoption of the measures advocated by Mr Thacker. Knowing that the natives were perfectly aware of the contagious nature of the disease, I was astonished, on accompanying Mr Thacker in his medical visits, to find the utter recklessness of their practice. The fact is, that the nature of their houses, and the want of necessary appliances and assistance, renders it impossible for a native to carry out strict isolation of diseased cattle in his own premises. It is unquestionable that at present the sound and diseased cattle mix together promiscuously in the Ryot's house and yard, and those not attacked are driven out at the usual hour for pasture with the village herd, spreading everywhere the seeds of a most dangerous malady. Unless some means be found to put a stop to this, it will be impossible to eradicate the disease. It may lie dormant for a time, but will again and again break out, and keep down the stock of the country in spite of its increasing wealth.

6. I have conversed frequently on this subject with Mr Thacker, and after much consideration can think of no means so suitable for the end in view as those suggested in his report. A short Act, embodying the provisions he recommends, might be passed in the local Legislative Council, and a breach of its provisions might be made punishable under Sections 269 and 270 of the Indian Penal Code.

7. I do not by any means advocate the universal application of such an Act, as it might be made an instrument of much tyranny and injustice; but power should be given to the Government to apply it to any particular locality, and the local authorities who applied for it would be responsible for its necessity, and for its provisions being enforced with discretion.

8. The following are the few simple provisions which it would be necessary to embody in the Act:—

*First*, That where the Act had been declared applicable to any locality, the inhabitants of any village might be required, on the order of the collector, to erect sheds for the accommodation of the sick cattle, in some locality outside the village, fenced so securely as to prevent the possibility of healthy cattle getting in, or sick cattle getting out.

*Second*, That a respectable agriculturist of the village be appointed to the charge of the sick lines, under control of the village munsiff, and be remunerated by a fee on each sick animal under his charge, payable only on recovery.

*Third*, That on any animal being attacked with murrain, the owner must at once report the fact to the village munsiff, and remove it to the sick lines, subject for neglect to punishment under Section 269 of the Indian Penal Code.

*Fourth*, The person appointed to the charge of the sick lines should be responsible for proper care of the sick animals, and should provide their gruel and medicines to be paid by the owner at a fair rate, to be fixed from time to time by the collector of the district.

*Fifth*, That the owner of any building in which a sick animal has been for a period of twenty-four hours, or upwards, be compelled forthwith to white-wash the walls and cow-dung the floor of the same, subject to a fine not exceeding 50 rupees.

9. It may be remarked that no provision is made for the burial of the bodies of animals that have died of the disease, a point in England much insisted upon; the customs of the country render such unnecessary in India. A dead animal is here immediately removed by the chucklers, and eaten, apparently, with perfect impunity, however death may have been caused.

10. It is impossible to bring forward statistics to show the actual losses of cattle by this disease in this Presidency. I believe it to be a moderate estimate to state that, on an average, at least two thousand head of cattle are swept away yearly in every district by the epidemic, which is as constant in its ravages as cholera amongst human beings. Fortunately the weaker and less valuable animals are in general the victims, but even with this compensation, the loss to the agricultural community is enormous, and its effects must be felt in checking the increase of cultivation which would otherwise progress even more rapidly than at present, and thus lowering the public revenue. In the interests of the State it is imperative that efficient measures be taken to grapple with this evil.

11. There is a striking fact in Mr Thacker's report which cannot fail to be remarked. The villagers of Ravypaud, while the disease was raging amongst their cattle, as soon as the revenue authorities had left the neighbourhood, ceased to avail themselves of Mr Thacker's assistance, and had so little confidence in his treatment, that, rather than undergo the trouble it entailed on them, they preferred to let their cattle die by leaving them to nature. The services of a skilful veterinary surgeon were available gratis, and yet he would have remained without opportunities of practice, in the midst of a violent epidemic, if Mr Arbuthnott had not returned to Cumbum, and ordered the Ryots to place their sick cattle under his charge.



12. It is true that after evident success attended his treatment, all this was changed: an emissary even came from a village in the Cuddapah District, where the disease was prevalent, to ask for Mr Thacker's assistance, when the fact of his cures became known. But the difficulty experienced in introducing the new practice makes me doubtful whether any commensurate results will follow the mere publication of a rational mode of treatment, the proper adoption of which ought to result in reducing the mortality fifty per cent. under this disease. Not only, as Mr Thacker suggests, must the medicines be for some time provided gratis to the Ryots, and the advantages of the new treatment be impressed upon them by the revenue authorities; but I think that a veterinary surgeon, with a liberal staff pay, should be appointed permanently to the special duty of teaching the natives how to treat the disease, and of enforcing the necessary remedial measures.

13. Such an officer should move from district to district, wherever his services might be most required, and there should be attached to him a staff of pupils from the Madras Medical College, who might be willing to adopt this branch of the healing profession. These would rapidly acquire a thorough knowledge of the pathology of the disease, and of its treatment, and by their means the benefits of superior veterinary knowledge could be extended more widely every year.

14. I can speak from personal experience of the zeal and patience displayed by Mr Thacker while engaged in his recent inquiries in this district; and I am confident that the duties I have sketched above could not be intrusted to better hands. On this occasion he was not sent with such an object, but simply to investigate the disease; and I have not felt justified in detaining him longer in the district after that end has been attained.

15. I think that the result of Mr Thacker's mission must be considered satisfactory; and as his visit to this district has caused him a loss of military pay, it only remains for me to recommend that an honorarium of one thousand rupees be paid to him, as well as the usual travelling allowance from Bangalore to Kurnool and back. The former charge can be met out of the salary for the assistant collector, and the latter out of the travelling allowance to officers unexpended in the budget of charges for the district for the last official year.

---

ENCLOSURE No. 1.—REPORT.—1. Observing my services placed at the disposal of Government to investigate the causes of an epidemic disease amongst cattle in the Kurnool district, I started with all practicable haste, hoping to find further instructions on reaching the district.

2. On the 21st of January I arrived at Kurnool; the collector being absent, I proceeded to join Mr Arbuthnott's camp, and there, for the first time, had the opportunity of reading the correspondence on the subject.

3. Early in February the collector returned from leave, and, on his advice, I accompanied him on Jumabundy, in order that his influence might be available in inducing the Ryots to place their sick cattle under treatment, and further the objects of my mission.

4. Although there were rumours of the disease being prevalent in all parts of the district, as well as in the Taluks where we were located, we found, on close investigation, such reports referred to ordinary diseases of cattle, and not to the special malady, or murrain, which it was my business to investigate.

5. It was not until the 4th of March that we were summoned by the villagers to Boodacherla, and found the true disease called in Teloogoo, "Pedda Moosa Rogum." On pitching our camp in this village we found four buffaloes labouring under the disease, and it was reported that there had been seven previous cases, of which, being left to nature, three only had died.

6. On the morning of our arrival one animal died, and I was enabled to have a *post-mortem* examination.

7. Until this time I was only acquainted with the disease by report, which had led me to consider it allied to, or identical with, the murrain that has for



many years been known to veterinarians; the result of this *post-mortem*, and many others which I was afterwards enabled to make, confirmed my opinion on this point.

8. In this village only four cases came under my treatment, two of which were successfully treated. At this period I must confess to much anxiety as to the success of my mission, it being doubtful whether a simple mode of treatment could be laid down to cope with so formidable a disease, and the apathy I found amongst the natives rendering its application doubly difficult.

9. At this time the collector (Mr Minchin) was ordered to Bellary, and both he and the head assistant-collector (Mr Arbuthnott) had to proceed to Kurnool on duty; before they left Cumbumo, a violent outbreak of the disease was reported in the neighbouring village of Ravypaud, and I arranged with the revenue authorities that my camp should be pitched there during their enforced absence.

10. On our arrival in Ravypaud, on the 11th of March, we found that one hundred and twenty-nine cattle had been attacked, of which sixty-nine had died, seventeen recovered, and the remainder were at that time in various stages of the disease. In communication with the collector, arrangements were at once made for my entering vigorously into the field of inquiry which was thus presented. On the 12th of March, Messrs Minchin and Arbuthnott left Cumbumo, and from the date of their departure the co-operation of the people with my inquiry entirely ceased. They had no grounds for confidence in my skill; the mode of treatment prescribed gave them more trouble than they liked; and they objected to being moved out of their accustomed habits. With the exception of such cases as had been placed in my hands before Mr Minchin's departure, no fresh cattle were entrusted to me for treatment, although the disease was raging throughout the village; fortunately Mr Arbuthnott returned to Cumbumo as soon as he was able, and by the exertion of his influence, I was enabled to take full occasion of the opportunity here afforded me of carrying out the inquiry for which I was sent to the district. Up to the close of April, I had forty-four cases under treatment, of which eleven were fatal, and thirty-three recovered,—a proportion which, considering the character of the disease, exceeded my expectations, and has proved satisfactorily its amenability to medical treatment.

11. Of the eleven fatal cases, I must remark that almost all were poor, weakly animals, and from my experience, cattle that were in good condition and well cared for when placed early under treatment, recovered in almost every instance.

12. Before the end of April, the disease had died out in Ravypaud, and being unable to find further scope for practice in that quarter, I rejoined the collector in Kurnool. At this time no epidemic of a violent character prevails in the district; the disease, in a mild form, is to be found in various localities, but as it offers no distinguishing differences of type from that which I have seen, and sufficiently investigated in Ravypaud, Mr Minchin concurs with me in thinking that the object for which I was sent to the district has been attained.

13. I must here state that there is one type of the disease, most prominently dwelt on in all the printed reports, which I have had no opportunity of witnessing. In this form of the malady the animal breaks out in pustules immediately after the attack, every other symptom being exactly similar to that form of the epidemic which I have met with. The natives state that the disease has this peculiar symptom during, or shortly after, the rainy season, and not during the dry months in which I have been in the district. I am of course unable to state whether any modification of treatment may be necessary for this form of the disease, and it will be for the Government to consider whether further investigations on this point be called for.

14. Mr Minchin is of opinion that it would not be right to detain me in the district for the length of time which might elapse before such cases could come under my observation. In my medical treatment of the disease my chief aim



has been to confine myself to the use of such remedies as are procurable by the poorest Ryot in the most remote village ; it would have been a mockery to prescribe expensive English medicines which could never have been available to the agriculturists of this country. The remedies employed, camphor, nitre, opium, and catechu, are procurable in every bazaar. Datoora is a weed that grows in the fields, and Cherayta is a plant found in almost every jungle. These medicines, in different proportions for the different stages of the disease, are the only ones which I found it necessary to administer. A detailed account of treatment will be found in an appendix. I would only here further remark, that a most important point is supporting the animal with nourishing gruel, which the natives appear to have entirely neglected, as it is their practice to leave a sick beast for many days without food of any description, in itself sufficient to cause death.

15. Many suggestions have been offered as to the causes of this disease. It has been attributed to general uncleanness ; want of care ; deficiency of proper food ; atmospherical influences ; and variations of food at different periods of the year. I am only prepared to state that the disease is evidently epidemic in character, and in my opinion unquestionably contagious. With respect to original causes, I would only say, in the words of an acknowledged authority on such subjects, "It is better to confess these are unknown, rather than by a laboured and pretended explanation to endeavour to conceal our ignorance."

16. My experience during this inquiry has made me acquainted to some extent with the domestic economy of the natives as regards their treatment of cattle. I have been for weeks in their villages ; have attended all my patients in the houses of the owners ; and have thus, for the first time, become familiar with the native habits. I have found that valuable cattle have been well cared for, and the majority of cases have occurred in poor animals, which either from old age or the poverty of the owners, have not received such good treatment. A deficiency of food unquestionably creates a tendency to take the disease, and gives the patient less chance of successfully combating it. The growing improvement in the condition of the agricultural class is a matter of notoriety, and, as I have before remarked, there is no neglect apparent in the care bestowed upon cattle that are considered worth the expense.

17. The cattle are housed with their owners, and are as well off as themselves in this respect. The general want of cleanliness in the houses of the people must be a cause of unhealthiness to man and beast ; it seems almost beyond legislative remedy.

18. Considering that the natives of this country have been agriculturists for generations, I have been surprised at the utter ignorance displayed by them in the treatment of cattle under disease.

19. They are particularly quick in detecting the existence of disease, and of any changes which take place in it ; their prompt perception of such changes is most marked, and with a proper mode of treatment laid down for their guidance should assist them to successful practice.

20. In this district when murrain has attacked the cattle, there has hitherto been no attempt at treatment whatever, the animals being left to struggle under the malady ten or twelve days without any effort even to support life ; and I doubt not that in many instances they might have been saved without medical treatment, if properly nursed and supported.

21. I consider the chief cause of the rapid extension of the disease after it has appeared in a village to be the extraordinary apathy and carelessness of the people in the matter of contagion. Those whom I have met seemed all to acknowledge that the disease was contagious, but none made the slightest effort towards prevention : isolation of sick cattle was never attempted, and the constant advice I gave on this subject was entirely disregarded. I have myself seen a miserable buffalo calf, not worth five rupees, with fetid mucous discharge from his nose and eyes, in close contact with a healthy bullock that was worth at least a hundred rupees. On remonstrating with the owner, he could only give idle

excuses as to the difficulty of enforcing isolation, and such is the apathy of the native character, that nothing short of compulsion by legislative enactment can, I think, remedy the evil.

22. As a professional man sent specially by Government to investigate a subject of such importance, and which has given rise to such extensive references and general consideration, it appears necessary for me to offer an opinion on the various suggestions that have been made for the treatment of the disease.

An injection of sugar of lead into the eyes, nose, and ears, has been recommended: such would be attacking a local symptom, instead of the disease, and I need hardly say must be utterly useless.

23. One officer speaks with astonishing confidence of possessing an infallible specific in common black salt. To call this simple purgative infallible is simply empirical.

24. Captain Nelson has suggested vaccination as a remedy. There is nothing in the nature of the disease to lead one to suppose that the introduction of the cowpox virus would serve as a prophylactic. As remarked by Assistant-Surgeon Bidie, murrain is a totally distinct disease from smallpox, and attacking different structures. Perhaps by vaccination was intended the introduction of matter from an animal infected with murrain to a healthy animal, or, as more properly called, inoculation. Inoculation is frequently referred to in the reports as the most likely remedial agent, and one which may seem most anxious should be tried.

25. Cases of inoculation in early times are reported in all histories of murrain, but the authenticity of these cases, or at all events the efficacy of the practice, is doubted by all the authorities of the present day. There can be little doubt that inoculation would produce the disease, but there is nothing to lead us to suppose that the disease thus taken would be in a mild form, or that having been once attacked by the disease would guard an animal from all future danger.

26. It appears to me that the practice of inoculation would be inducing what it is our chief object to prevent, a propagation of this most dangerous malady.

27. Such being the received professional opinion of the day, from which I see no reason to differ, I could not conscientiously carry out any experiments in this way without being prepared to give compensation to the owners of cattle for possible or rather probable loss.

28. As the collector stated his inability to provide any means for such an expenditure, I was unable to attempt the experiment.

29. Should the Government differ in opinion, and consider inoculation deserving of a thorough trial, I can see no means for its being done except on their own cattle.

30. I offer now such general remedial measures as appear to me to be advisable; their practicability I leave to be determined by the proper authorities.

31. The medical treatment of cattle under an attack of the disease will be found detailed in an appendix to this report. On this part of the subject I will only add, that simple as are the remedies I have prescribed, I fear that the Ryots will take no care for their correct preparation, nor till they have had practical proof of their value would they go to the expense of purchasing them, absurdly trifling as that expense would be.

32. I beg to recommend that the remedies prescribed in my treatment be made up by Government, and kept in store by the Tahsildars for distribution. As I before stated, they are procurable in every considerable village, and after the Ryots have experience of the benefits attending their use, there is no doubt they will procure them for themselves.

33. I now proceed to describe such preventive measures as are necessary to check the spread of this malignant epidemic. For this purpose perfect separation of the sick from the healthy animals of the village should be enforced. On an animal being attacked the owner should be compelled at once to remove it to a separate locality, appointed for the purpose, outside the village. A tope



conveniently situated might be set apart for this object, or if none be available, it would be necessary to erect sheds to protect the sick animals from exposure to the sun or rain. This locality should be carefully fenced, so as to prevent the possibility of healthy animals, by any accident, coming in contact with the diseased. The objections that would be raised to such a measure by the Ryots, would arise chiefly from the difficulty they would experience in providing attendance for their sick cattle, at a distance from their own houses. To meet this, one of the servants of the village should be appointed to this special duty, who might be remunerated by fees levied from the owners of cattle under his care.

34. As a further precaution, in the case of any house or stable from which a diseased animal has been removed, the walls should be whitewashed, and floors cow-dunged.

35. I believe that I have now stated all the measures which I consider to be desirable to be enforced, and have laid down a mode of treatment which, if pursued judiciously, should be followed by reasonable success. I am convinced, however, that the natives will require much guidance in the matter; if left to themselves it is probable that very little will be done, and after some time the state of affairs will relapse into the present condition of reckless neglect on the appearance of this epidemic.

36. The loss to the community and the Government by the present state of things is so great, a loss which, in my opinion, is in a great measure preventable, that I think it would be to the true interests of Government to appoint a qualified officer to the special duty of interesting the Ryots how to treat the malady, and observing that the necessary measures are carried out.

37. An intelligent officer, moving from district to district where his services might be most required, by gaining the confidence of the people, combating their weaknesses, and insisting on the performance of the necessary measures to cope with the disease, might in a great measure bring it under control, and would unquestionably save thousands of rupees' worth of valuable property every year.

(Signed) J. THACKER,  
Veterinary Surgeon.

#### APPENDIX TO REPORT.

##### *Murrain.*

Called in Telooogo "Pedda Moosa Rogum," is an epidemic, contagious, typhoid fever, commencing in a general congestion, with mucous discharge from the eyes and nose, followed by inflammation of the "Abomasum," or last compartment of the stomach and intestines; accompanied at certain seasons of the year with falling off of the hair, formation of pustules on the skin, and always ending in violent purging mixed with mucus and blood.

##### *Symptoms.*

*First Stage.*—The attack generally comes on gradually, evidenced by occasional shivering fits, the appetite slight, the animal appears dull, with drooping ears, and a rough staring coat; the bowels costive, rumination ceased or slightly performed, eyes weeping, pulse quickened.

*Second Stage.*—The appetite entirely gone, nose dry and hot, and which commences to discharge thick mucus, which also now takes place from the eyes; purging commenced; lining membrane of the eyelids of a dark red colour, pulse quick and small.

*Third Stage.*—Generally lying down from weakness, purging violent, very offensive, mixed with slimy mucus and blood, is passed frequently in small quantities, and attended with straining. The eyes become sunk, the countenance anxious, general restlessness, partial insensibility and death. In this state the pulse is generally imperceptible or extremely quick and small.

*Post-mortem* examination shows the Abomasum or last compartment of the

stomach, and portions of the bowels inflamed ; attended sometimes with slight effusion or dropsy ; this is the general appearance, and the exceptional cases and changes are not necessary to mention.

#### *Treatment.*

From the great tendency to run into a low typhoid type, and accompanied as it almost always is in the latter stages with violent debilitating purgation, and at some seasons of the year with a number of open discharging pustules, it is absolutely necessary that great care and moderation be observed in the administration of any medicinal agent, which might, and assuredly would if largely given, produce the very results which it is desirable to avoid.

It should always be borne in mind that our main object is to support the strength, and assist the curative powers of nature through an attack that generally lasts from seven to ten and even fourteen days, during which time the patient partakes of little or no food.

The bowels being costive early in the disease, a mild laxative may be given, and to avoid the slightest chance of too much action it is safer to give small repeated doses ; which end I think I have best obtained by administering two or three ounces of finely powdered sulphur in two quarts of gruel morning and evening, until some slight effect is observable.

As this is an inflammatory disease the sedative and narcotic class of medicines are most appropriate. Of those easily procured in the bazaars, and with which I have been most successful, the following may be given morning and evening:—camphor, 2 drachms ; nitre, 2 drachms ; datoora, 1 drachm ; cherayta, 2 drachms ; arrack, 4 ounces. Dissolve the camphor in the arrack, carefully powder and mix the other ingredients, than add two quarts of gruel and carefully pour down the throat with a drenching horn.

When the diarrhœa commences it is not desirable to attempt suddenly to arrest it, as it is an effort of nature to relieve the system, but if allowed to go on to any large amount the debility produced would impede recovery, so that after it has existed about twenty-four hours, the following finely powdered may be added to the preceding prescription:—opium, 1 drachm ; catechu, 3 drachms.

The postules, which at certain seasons appear, should be carefully washed twice a day, and the simple mixture consisting of camphor dissolved in oil should be applied twice a day to prevent a deposit of flies' eggs, and the generation of maggots ; further applications will generally be found unnecessary, and they will become healthy as the internal disease subsides.

As soon as there are symptoms of improvement, the medicines should be diminished or discontinued, as the recovery is generally very rapid, and requires nothing beyond supporting the strength with gruel, to which may be added the dose of arrack in extreme weakness. As soon as the animal shows the slightest inclination for food, he should be frequently supplied with small quantities of green grass, raggy, sugar-cane, or cholum.

The following is the proper method of making gruel:—One pound of jonna or any other wholesome grain should be ground to a fine meal, and this meal be gradually mixed in two quarts of boiling water ; to be given when cold.

In administering a drench, should the operation cause the animal to cough, the head should be immediately released, and no attempt made to continue giving the remedy for a few minutes ; persistence in pouring down the draught at such a time would probably result in the suffocation of the animal.

Owners of cattle cannot be too strongly impressed with the necessity of separating any animal showing symptoms of this disease from their healthy cattle. The disease unquestionably spreads through the village herd by contagion, and by strict isolation of diseased cattle, the spread of it may be greatly prevented. Murrain is so formidable a malady that under the most careful treatment there must be many fatal cases, and the Ryots should never forget that prevention better than cure.



It is most desirable that in any building where diseased cattle have been, the walls should be white-washed and the floors cow-dunged to make it safe for the use of healthy animals.

(Signed) J. THACKER, *Veterinary Surgeon*.

1. Ordered to be submitted to Government with the Board's recommendation that Mr Minchin's proposals in the last paragraph of his letter for Mr Thacker's remuneration be sanctioned.

2. The result of the inquiry and treatment of the disease must be deemed very satisfactory, as warranting the belief that this serious evil can be controlled with comparative ease; but the Board concur in the opinion that legislative action is necessary to compel the owners of diseased cattle to take reasonable precautions against injuring their neighbours'.

3. They leave the point for the consideration of Government.

(Signed) W. HUDLESTON, *Sec.*

Read the following letter from the Collector of Coimbatore, dated Otacamund, 8th June 1864, No. 122 :—

1. A few days ago I received with Board's Miscellaneous Circular, No. L, dated 20th May 1864, Extracts from Reports from Bengal, &c., regarding the nature of the diseases which had been prevalent among cattle in the Bengal Presidency. Unfortunately for this part of the country murrain has been and is now most severe amongst cattle. Understanding that Mr M'Ivor, Superintendent of the Government Chinchona plantations, had lost a number of valuable animals, and that he had taken trouble to ascertain the nature of the disease of which they died, I sent the above papers to him for perusal with a request that he would, in view to its communication to Government, favour me with the result of his inquiries on the disease.

2. This he has now done, and I beg to transmit his original letter on the subject. His letter will, I believe, be found to contain the fullest and clearest account of the disease hitherto given. I have never heard of a disease which has proved more fatal to the cattle than that which is now raging on these hills. It is most infectious and insidious, and the chances are that if measures are not at once adopted to separate the infected animal from the herd, the whole of them will be lost within five days.

## OBITUARY.

HORSE AND RIDER BOTH KILLED.—A few nights ago, Mr Hornby, veterinary surgeon, of Kirkby Moorside, North Riding, when riding home in the dark, was thrown from his horse on the road between Nawton and Kirkby, the animal having fallen over something on the road. It is believed that the horse rolled over Mr Hornby, but this is not certain. The animal itself was so injured that it shortly afterwards died, and Mr Hornby also received injuries which caused his death on Saturday—*Durham County Advertiser*, October 28, 1864.

## INDEX TO VOLUME VI.

---

- Abscess in the walls of the heart, by W. Hunting, South Hetton Collieries, Durham, 18.
- pulsating, on a cow's sternum, by W. A. Cartwright, M.R.C.V.S., 16.
- Action for the price of a horse, 37.
- Acute induration of the spermatic cord, 500.
- Address by Mr Greaves, 716.
- of the Royal Agricultural Society of Ireland, to Her Majesty, 427.
- Admiral Rous on racing and race-horses, 492.
- A few words upon race-horses, 568.
- Agricultural education, by Roberts and Green, 29.
- Alleged deterioration of the horses produced in recent years in Ireland, 399, 419.
- Amputation of the penis in a pony, by Charles Dayas, 211.
- Animal food, appropriateness of, in the diet of man, 380.
- Annual Meeting of the Royal College of Veterinary Surgeons, 344.
- Anthrax fever at Swineshead, 632.
- Appropriateness of animal food in the diet of man, 380.
- Apoplexy, parturient, by Robert Watson, M.R.C.V.S., 1.
- splenic, by Dr Crisp, 40.
- Are we progressing? by a Veterinarian, 582.
- Armatage, Mr G., V.S. to the Marchioness of Londonderry—Veterinary records. Diseased cattle and the ends to which they are appropriated. Uræmia occurring from occlusion of the urethra in an ox. Scrofulous disease in a bull, 577.
- veterinary records, 626.
- Arsenic, its physiological effects, 630.
- Baillie, James, on ruminotomy, 208.
- Banquet of the President of the Royal College of Veterinary Surgeons, 678.
- Barren mares, 429.
- Bacon, on the past and present of the Irish turf, 126, 161.
- Bearded ryegrass or darnel, 482.
- Begbie, Dr Warburton, on the requirements for the proper study of disease; introductory lecture at the Medical School, for the session 1863-64, 53.
- Bland, George, on cases of parturition, 530.
- Braxy, a morsel for Professor Gamgee, 184.
- Breaking down, 430.
- Breed of Irish horses, 496.
- Bræding and management of horses, by Professor Gamgee, senior, New Veterinary College, Edinburgh, 449.
- for the turf in Scotland, 102.
- of horses, 157, 172.
- of horses in Ireland, 497.
- British Pharmacopœia, 149, 216.
- Bronchial polypus, by J. M. Parker, M.R.C.V.S., 20.
- Bronchitis in the ox, 298.
- Bruce, Alex., Chief Inspector of Sheep for the Colony of New South Wales, on scab in sheep and its cure, 595.
- Budd, Dr Wm.—Memorandum of a scheme for the investigation of epidemic and epizootic diseases. Drawn up at the request of a committee appointed for that object, at the Annual Meeting of the British Medical Association in August 1862, 626.
- Bull, scrofulous disease in, by G. Armatage, V.S. to the Marchioness of Londonderry, 579.
- Butter and tar, 125.
- Cameron, Professor Charles A., Ph.D., M.D., M.R.I.A., Honorary Member of the Agricultural Societies of New York, Belgium, &c., Analyst of the City of Dublin—The quality of meats, 129.
- Cancer of the tongue in an ox, 153.
- Cardiac polypi in a mare, by John George Dickinson, 262.
- Cartwright, W. A., M.R.C.V.S., Whitechurch, Salop. Pulsatory abscess on a cow's sternum, 16.
- W. A., on extraction of a foal with the head back, 524.
- on extraction of a calf with ruptured uterus, 529.



- Cartwright, W. A., M.R.C.V.S., Whitechurch, Salop, on the Lancashire Veterinary Medical Association, 212.
- Case illustrating the dangers of slaughtering diseased cattle, by Professor Gamgee, 164.
- of lameness, by Professor Gamgee, senior, 146.
- Cases of extraction of a calf with premature labour pains, by W. A. Cartwright, 527.
- of parturition, by George Bland, 530.
- of strangles, by James Miller, Veterinary Surgeon, Bradninch, Devon, 462.
- Cattle conveyance across seas. Proposed cattle ships, 422.
- disease (anthrax fever) at Swineshead, 632.
- disease in India, report on, 684, 752.
- diseases prevention bill, 248, 404, 471, 504.
- ships. Proposed conveyance of cattle across seas, 422.
- the diseases of, 128.
- trucks, 64.
- Ceely, Mr Robert, on anthrax fever at Swineshead, 632.
- Chancellor of the Exchequer, hint for : Diseased meat, diseased milk, 434.
- Chemical composition of the bones in a case in which fracture of the navicular bones of the hind feet of a mare, accompanied by detachment of the tendon, occurred as a result of violent muscular action, by Arthur Gamgee, M.D., 391.
- Chemistry and physiology of the milky fluid found in the placental cotyledons of ruminants, by Dr Arthur Gamgee, 94.
- of foetal nutrition, by Dr A. Gamgee, 94.
- of the feeding of animals, for the production of meat and manure, by John Bennet Lawes, F.R.S., F.C.S., 367.
- Chronic lameness in horses, by Professor Gamgee, senior, 193.
- lameness, 286.
- lameness of horses, 266.
- Clarke on the melophagus, 117.
- Cocksfoot grass, 485.
- Colic, intussusception, vomiting, and death, the sixth day, in a cow, by Andrew Simpson, 724.
- Comparative feeding value of different kinds of food, according to their composition, 375.
- value of the different grasses, by Archibald Sturrock, Kilmarnock, 475, 571.
- Composition of oxen, sheep, and pigs in the store and fat condition, 368.
- Condylomata in the dog, by James Law, M.R.C.V.S., New Veterinary College, 329.
- Congestion of the udder garget, 438.
- Conjunctivitis, granular, by A. J. Murray, Royal Agricultural College, Cirencester, 585.
- Connection between the value of the manure and the composition of the food consumed, 378.
- Contagious diseases of animals, legislation to prevent, 175.
- Contributions to the chemistry and physiology of foetal nutrition, being an inaugural thesis to which the Medical Faculty of the University of Edinburgh awarded a gold medal in 1862, by Arthur Gamgee, M.D., late Senior President of the Royal Medical Society, Edinburgh, late Resident Physician in the Royal Infirmary, and Assistant to the Professor of Medical Jurisprudence in the University of Edinburgh, 94.
- Conveyance of cattle across seas. Proposed cattle ships, 422.
- of diseased cattle, 310.
- Conviction for selling diseased meat, 410.
- of a Scotch cattle-dealer in London, 36.
- Correspondence, 334.
- Cotton cake, poisoning by, 417.
- Council of the Royal College of Veterinary Surgeons, 104.
- special meeting of, 354.
- Cow-pox, origin of, 186.
- Crisp, Dr Edwards, on splenic apoplexy, 40.
- Critical and explanatory comments on the new pharmacopœia, indicating the extent and character of the changes made, and the relative value of the new and old processes and preparations, 119.
- Curling, T. B., F.R.S., Surgeon to the London Hospital, on sterility in man, with cases, 361.
- Dairy system of William Harley, 187.
- Darnel, or bearded ryegrass, 482.
- Dayas, Charles, on amputation of the penis in a pony, 211.
- Death of Professor Miller, 448.
- of George Ernest Llewellyn, 430.
- Destruction of racing stock at Swacliffe Paddocks, 703.
- Deterioration of the horses produced in recent years in Ireland, 399, 419.

- Dickinson, John George, cardiac polypi in a mare, 262.
- Different grasses, their comparative value, 622.
- Dipping sheep, operation of, 166.
- Discoveries in entozology, 114.
- Discussions on horse breeding, 543.
- Diseased animals, danger of slaughtering, by Professor Gamgee, 164.
- cattle, and the Cattle and Meat Importation Acts, 225.
- cattle, and the ends to which they are appropriated, by G. Armatage, V.S. to the Marchioness of Londonderry, 577.
- meat, 312.
- meat cases, 633
- meat, conviction for selling, 410.
- meat, diseased milk: hint for the Chancellor of the Exchequer, 434.
- meat prosecutions, 33.
- milk, diseased meat: a hint for the Chancellor of the Exchequer, 434.
- Diseases to which the feet of horses are subject, by Professor Gamgee, senior, 321.
- of cattle, 128.
- of Cattle Prevention Bill, 504.
- Dog, condylomata in, by James Law, M.R.C.V.S., New Veterinary College, 329.
- Editorial remarks on Mr Hunting's case of cardiac abscess, 19.
- Effects of white hellebore on the horse, by G. Armatage, V.S., 651.
- English blood-horse, observations on, by Professor Gamgee, senior, 587.
- Entozoa, 662.
- Entozology, recent discoveries in, 114.
- Epidemic and epizootic diseases, scheme for investigating, 626.
- Epithelial tumours in the domestic animals, and particularly canker of the lips in the horse and cat, 440.
- Esophagus ventriculosus, or sacculous dilatation of the gullet, vomiting, choking, &c., 641.
- Examination of the brain, 276.
- Exposition of the anatomical arrangement of the hoof of the horse, by Professor Gamgee, senior, 257.
- Extraction of a foal with the head back, by W. A. Cartwright, 524.
- Eye of the horse, worm in, by T. Hickman, Esq., V.S., late Bengal Army, 652.
- Farriers, status of, by Professor Gamgee, senior, 636.
- Fever, parturient vitulary, 501.
- puerperal, by Robert Watson, M.R.C.V.S., 1.
- Fœtal nutrition, chemistry of, by Dr Arthur Gamgee, 94.
- Foot-and-mouth disease in cattle, 60.
- Forage plant, new, 435.
- Foreign bodies in the stomachs of ruminants, 305.
- stock, their importation, 91.
- Formation of the so-called intercellular substance of cartilage, 301.
- Founder, 614.
- Fox-tail meadow grass, 487.
- Fracture of the sesamoid bones of the off fore-leg of a horse, with luxation of the fetlock joint, by Professor Varnell, 432.
- Fractures of bones and strains of some of great ligaments and tendons of the limbs of the horse, by Professor Gamgee, senior, 385.
- Furstenberg, Professor, on *Trichina spiralis*, 513.
- Gamgee, Dr Arthur, on the chemistry of fœtal nutrition, 94.
- Gamgee, Professor, on the danger of slaughtering diseased cattle, 164
- on the scope and objects of the veterinary profession, 605.
- Gamgee, Professor, senior, on "breaking down," 284.
- on the breeding and management of horses, 449, 655.
- case of lameness, associated with discreditable proceedings on the part of persons concerned in the sale of a horse, 146.
- chronic lameness in horses, 193.
- on diseases to which the feet of the horse are subject, 321.
- exposition of the anatomical arrangement of the hoof of the horse, 257.
- observations on the English blood-horse, 587.
- on fractures of bones and strains of some of the great ligaments and tendons of the limbs of the horse, 385.
- observations on short-legged horses, 532.
- on the status of farriers; what it is, and what it should be: An address read before the farriers of Edinburgh and Leith, on the evening of the 5th February 1864, 136.
- the history, progress, and present requirements of the art of horse-shoeing, with an outline of views on the mechanism and economy of the horse's foot, 65.
- Garget, congestion of the udder, 438.
- Gluge, Monsieur, Member of the Royal Academy of Sciences, on experiments



- on the union of sensitive and motor nervous fibres, 310.
- Granular conjunctivitis, by Professor Murray, 585.
- Grass, cocksfoot, 485.
- meadow fescue, 484.
- meadow fox-tail, 487.
- staggers in cattle, impaction of the manyfolds, 425.
- Grasses, comparative value of, by Archibald Sturrock, Kilmarnock, 475.
- their comparative value, 622.
- Great horse show at London, 464.
- Greaves, Thomas, obstructions in the bowels of dogs, 269.
- Green crop, yield of, 436.
- Greenhow, Dr, on *Tœnia medio-canellata*, 62.
- Grogginess, 616.
- Gullet, sacculous dilatation of, vomiting, choking, &c., by G. Armatage, V.S., 641.
- Harley, William, and his dairy system, 187, 253.
- Hay, yield of, 436.
- Heart, abscess in the walls of the, by W. Hunting, South Hetton, 18.
- Healthy stables, 703.
- Hickman, Thomas T., V.S., late Bengal Army, on the removal of a diseased phalanx in an elephant, 721.
- on worm in the eye of the horse, 652.
- Higgins, James, meat inspector, Leeds, on the foot-and-mouth disease in man, and the sale of diseased animals, 330.
- Highland and Agricultural Society, the cattle disease prevention bills, 241.
- Hint for the Chancellor of the Exchequer: diseased meat, diseased milk, 434.
- Horse breeding and racing, 494.
- breeding in Ireland, 497.
- breeding in Scotland, 102.
- effects of white hellebore on the, by G. Armatage, V.S. 651.
- Horse-shoeing, its history, progress, and general requirements, by Joseph Gamgee, senior, Professor in the New Veterinary College, Edinburgh, 65.
- Horse show at London, 464.
- Horses, breeding of, 157, 172.
- Hunting, W., South Hetton, on abscess of the walls of the heart, 18.
- Hurrell, C. H., on inversion of the uterus of a mare, 210.
- Hydrophobia, 434.
- Iconoclast on the turf and the Scotch, 109.
- Identity of pleuro-pneumonia, and rubæola, by W. Thomson, M.R.C.S., 355.
- Identity of pleuro-pneumonia and measles, 421.
- Impaction of the manyfolds, grass staggers in cattle, 425.
- Import of foreign stock into England, 91.
- Induration, acute, of the spermatic cord, 500.
- Inflammation of the udder, mammitis, 445.
- Influence of London cow-houses on public health, 63.
- of physical conditions of soil in the application of ammonia and phosphates to turnips, 308.
- Inoculation of cattle, by W. A. Cartwright, 212.
- Inspection of markets 511, 625.
- of meat, 405.
- Inversion of the uterus of a mare, by C. H. Hurrell, 210.
- Ireland, horse-breeding in, 497.
- Irish horses, 31,
- horses, the breeding of, 496.
- turf, by Beacon, 161.
- turf, Beacon on, 126.
- Italian ryegrass, 401.
- Laboratory Guide for Students of Agricultural Chemistry, arranged by Arthur Herbert Church, M.A., of Lincoln College, Oxford; Professor of Chemistry in the Royal Agricultural College, Cirencester, 668.
- Lameness in horses, by Professor Gamgee, senior, 193.
- Laminitis, 614.
- Lancashire Veterinary Medical Association, 229, 718.
- secretary's official report, 409.
- Langenbeck, Professor, on a case of trichinal infection, 126.
- Law, James, M.R.C.V.S., New Veterinary College, on condylomata in the dog, 329.
- on the physiology of the pneumogastric nerve in the horse, 23, 80.
- Lawes, John Bennet, F.R.S., and F.C.S., on the chemistry of the feeding of animals for the production of meat and manure, 367.
- Leading article on horse-breeding, 102.
- Legislation for the prevention of disease, 155, 175.
- Letter on laminitis and navicular disease, 614.
- Liebig on the mineral theory, 180.
- and the mineral theory, 303.
- Llewellyn, George Ernest, 430.
- London cow-houses: their influence on public health, 63.
- great horse show, 464.

- Lymphatic radicles in the kidneys of the mammalia, 300.
- Mammitis, inflammation of the udder, 445.
- Management and breeding of horses, by Professor Gamgee, senior, New Veterinary College, Edinburgh, 449, 655.
- Manyfolds, impaction of, grass staggers in cattle, 425.
- Mares, barren, 429.
- Market inspectorships, 511, 625.
- Meadow catstail or timothy grass, 483.
- fescue grass, 484.
- foxtail grass, 487.
- rough-stalked grass, 485.
- Measles and pleuro-pneumonia, identity of, 421.
- Meat inspection. 405.
- Meats, quality of, by Professor Cameron, Dublin, 129.
- Mechanism and economy of the horse's foot, by Professor Gamgee, senior, 65.
- Medicine, requirements for the proper study of, by Dr Warburton Begbie, 53.
- Meeting of the Lancashire Veterinary Medical Association, 718.
- of the North of England Veterinary Medical Association, 105, 675.
- Melophagus, or sheep tick, by L. Law Clarke, 117.
- Melossoon dip, 175.
- Memorandum of a scheme for the investigation of epidemic and epizootic diseases, by W. Budd, M.D., Clifton, 626.
- Metro-peritonitis and parturient fever, by Robert Watson, 1.
- Milky fluid found in the placental cotyledons of ruminants, its chemistry, by Dr Arthur Gamgee, 94.
- Miller, James, veterinary surgeon, Bradninch, Devon, cases of strangles, 462.
- Mineral theory, by Baron Liebig, 180.
- Murrain in cattle, 60.
- Murray, A. J., Professor of Veterinary Surgery in the Royal Agricultural College, Cirencester, on results of neurotomy, 397.
- granular conjunctivitis, 585.
- typhoid fever in a pig, 586.
- Nature of accidents from the use of poisonous dips for sheep, 176.
- Navicular disease, 616.
- Neurotomy, results of, by A. J. Murray, Professor of Veterinary Surgery in the Royal Agricultural College, Cirencester, 397.
- New forage plant, 435
- members of the profession, 353.
- New pharmacopœia, critical and explanatory comments on, 119.
- Zealand, pleuro-pneumonia in, 488.
- North of England Veterinary Medical Association, meeting of, 105, 675.
- Notes on the occurrence of two examples of medio-canellata in the same patient, by Edward Headlam Greenhow, M.D., F.R.E.P., assistant-physician to the Middlesex Hospital, 63.
- Obituary, 128, 320, 660, 704, 760.
- death of Professor Miller, 448.
- Observations on short-legged horses, by Joseph Gamgee, senior, 532.
- on sterility in man, with cases, by T. B. Curling, F.R.S., Surgeon to the London Hospital, and Examiner in Surgery to the University of London, 314, 361.
- Obstructions in the bowels of dogs, by Thomas Greaves, 269.
- Official Report, Secretary's, Lancashire Veterinary Medical Association, 409.
- On breaking down, 430.
- On cavalry shoeing, 545.
- On connective tissue, 301.
- On entozoa, 662.
- On fractures of bones, and strains of some of the great ligaments and tendons of the limbs of the horse, 385.
- On regulating the sex of the offspring of animals, 418.
- On the chemistry of the feeding of animals for the production of meat and manure, by John Bennet Lawes, F.R.S., F.C.S., 367.
- On the identity of pleuro-pneumonia and rubeola, by W. Thomson, M.R.C.S. (Read before the Medical Society of Victoria), 355.
- On the removal of a diseased phalanx in an elephant, by Thomas Hickman, 721.
- Operation of dipping sheep, 166.
- Origin of cow-pox and nature of the vaccine virus, 186.
- Ox, occlusion of the urethra in, by G. Armatage, V.S. to the Marchioness of Londonderry, 578.
- Oxen, sheep, and pigs, composition of, in the store and fat condition, 368.
- Paraplegia in the cow, 301.
- Parker, J. M., M.R.C.V.S., Birmingham, on bronchial polypus, 20.
- Parts, proportion of, in animals of different descriptions, and in different conditions of maturity, 369.
- Parturient apoplexy and metro-peritonitis, by Robert Watson, M.R.C.V.S., 1.
- fever, vitulary fever, 501.
- Past and present of the Irish turf, and



- its effects on breeding, by "Beacon," 126, 161.
- Pattinson, Robert, veterinary student, Dearham, Maryport, on vaginal polypus, 654.
- Physiological effects of arsenic, 630.
- Physiology of the horse's pneumogastric nerve, by James Law, M.R.C.V.S., 23, 80.
- Pig, typhoid fever in, by Professor Murray, Royal Agricultural College, Cirencester, 586.
- Pleuro-pneumonia and measles, identity of, 421.
- in Britain and in the Colonies, 311.
- in New Zealand, 488.
- Pneumogastric nerve, physiology of, by James Law, M.R.C.V.S., 23.
- Poisoning by cotton cake, 417.
- Poisonous sheep dips, nature of accidents from, 176.
- Polypus, vaginal, by Robert Pattinson, veterinary student, Dearham, Maryport, 654.
- Practical cases, by John George Dickinson, 265.
- Preliminary examinations, 731.
- Prevention bill, cattle diseases, 251, 404, 471, 504.
- Prevention of contagious diseases in animals, 175.
- of disease, legislation for, 155.
- Price of a horse, action for, 37.
- Proportion of parts in animals of different descriptions and in different conditions of maturity, 369.
- Prosecutions for the sale of diseased meat, 33.
- Public health, influence of London cow-houses on, 63.
- Pulsating abscess on a cow's sternum, by W. A. Cartwright, M.R.C.V.S., 16.
- Quality of meats, by Professor Cameron, Dublin, 129.
- Quarterly Meeting of Council of Royal College of Veterinary Surgeons, 472, 673.
- Meeting of Council, 104.
- Rabies, 434.
- Racing and horse-breeding, 494.
- as an incentive to the promotion of the breed of the highest class of horse, 341, 405.
- and race-horses, by Admiral Rous, 488.
- stock at Swacliffe Paddocks, destruction of, 703.
- Regulating the sex of the offspring of animals, 418.
- Relation of the increase, manure, and loss by respiration, to the food consumed by different animals, 370.
- Reply by Professor Gamgee, senior, to Geo. Fleming, Esq., F.R.G.S., F.A.S.L., and V.S. King's Own Hussars, on shoeing of our cavalry horses, 393.
- Report by Mr Robert Ceely, on an outbreak of cattle disease (anthrax fever) at Swineshead, 632.
- of cattle disease in India, 684, 752.
- on vaccination of sheep, under the direction of the Lords of Council, 509.
- Reprint of remarkable memoirs, chemistry of foetal nutrition, by Dr A. Gamgee, 94.
- Requirements for the proper study of medicine, by Dr Warburton Begbie, 53.
- Results of neurotomy, by A. J. Murray, Professor of Veterinary Surgery in the Royal Agricultural College, Cirencester, 397.
- Review of agricultural education, by Roberts and Green, 29.
- Roberts and Green on agricultural education, 29.
- Rough-stalked meadow grass, 485.
- Royal Agricultural Society of Ireland, Address of, to Her Majesty, 427.
- Royal College of Veterinary Surgeons, annual meeting of, 344.
- quarterly meeting of Council, 104, 472, 673.
- special meeting of Council, 354.
- Ruminotomy, by James Baillie, 208.
- Ryegrass, 477.
- bearded or darnel, 482.
- Italian, 481.
- saving as a crop in rotation, 480.
- varieties of, 480.
- Sacculous dilatation of the gullet, vomiting, choking, &c., 641.
- Sale of diseased animals, and the foot-and-mouth disease in man, by James Higgins, meat inspector, Leeds, 330.
- Saragossa, accident to, in the Oaks. The Hampton Court yearlings, 437.
- Scab in sheep, and its cure, by Alexander Bruce, chief inspector of sheep for the colony of New South Wales, 595.
- Scheme for the investigation of epidemic and epizootic diseases, 626.
- Scope and objects of the veterinary profession, by Prof. John Gamgee, 705.
- Scrofulous disease in a bull, by G. Armatage, V.S. to the Marchioness of Londonderry, 579.
- Seaman on worms and fibrinous concretions in the blood-vessels of horses and colts, 520.
- Secretary's official report of the Lan-

- cashire Veterinary Medical Association, 409.  
 Seed, yield of, 436.  
 Selling diseased meat, conviction for, 410.  
 Sesamoid bone, fracture of, in the off fore-leg of a horse, with luxation of the fetlock joint, by Prof. Varnell, 432.  
 Sex, regulating of, in the offspring of animals, 418.  
 Sheep-dipping, 166.  
 — dips, nature of accidents from poisonous, 176.  
 — vaccination report, under the direction of the Lords of Council, 509.  
 — scab in, by Alexander Bruce, chief inspector of sheep, New South Wales, 595.  
 — tick, 117.  
 Shoeing of our cavalry horses, being a reply, by Prof. Gamgee, sen., to George Fleming, Esq., F.R.G.S., F.A.S.L., and V.S. King's Own Hussars, 393.  
 Simpson, Andrew, M.R.C.V.S., Fettercairn, on cancer in the tongue of an ox, 153.  
 — on colic, intussusception, vomiting, and death the sixth day, in a cow, 724.  
 Special meeting of council of Royal College of Veterinary Surgeons, 354, 474.  
 Spermatic cord, acute induration of 500.  
 Splenic apoplexy—so called, by Edwards Crisp, M.D., F.Z.S., 40.  
 Stables, healthy, 703.  
 Sterility in man, observations on, by T. B. Curling, F.R.S., surgeon to the London Hospital, 361.  
 Strangles, cases of, by James Miller, veterinary surgeon, Bradninch, Devon, 462.  
 Straw, yield of, 436.  
 Sturrock, Archibald, on comparative value of different grasses, 571, 622.  
 Summer season and veterinary education, 335.  
  
*Tania medio-canellata*, two examples of, in the same subject, by Dr Greenhow, 62.  
 Tar and Butter, 125.  
 Tetanus, by J. Thomas, 271.  
 The accident to Saragossa in the Oaks. The Hampton Court yearlings, 437.  
 The blood corpuscles of man and beasts, 320.  
 The castration of lambs, 313.  
 The cattle diseases prevention bill, 404.  
 The foot-and-mouth disease in man, and the sale of diseased animals, by James Higgins, meat inspector, Leeds, 330.  
 The Hampton Court yearlings. The accident to Saragossa in the Oaks, 437.  
 The Leporide, 415.  
 The profession, new members of, 353.  
 The status of farriers, by Prof. Gamgee, senior, 136.  
 The turf and the Scotch, by "Iconoclast," 109.  
 Thiernesse, M. A., Member of the Royal Academy of Medicine, on the union of sensitive and motor nervous fibres, 310.  
 Thomas, J., on tetanus, 281.  
 Thomson, W., M.R.C.S., on the identity of pleuro-pneumonia and rubeola, 355.  
 Timothy grass or meadow catstail, 483.  
 Tobacco juice, liquor, and paper, 170.  
*Trichina spiralis*, by Professor Furstenberg, 513.  
 Trichinal infection, by Professor Langenbeck, 126.  
 Trichnia panic in Germany, 169.  
 Tumour within the substance of the brain, 276.  
 Tumours, epithelial, in the domestic animals, and particularly canker of the lips in the horse and cat, 440.  
 Udder, congestion of garget, 438.  
 — inflammation of mammitis, 445.  
 Uræmia occurring from occlusion of the urethra of an ox, by G. Armatage, V.S. to the Marchioness of Londonderry, 578.  
 Vaccination of sheep, report on, under the direction of the Lords of Council, 509.  
 Vaccine virus, nature of, 186.  
 Vaginal polypus, by Robert Pattinson, veterinary student, Dearham, Maryport, 654.  
 Vagus nerve, physiology of, by James Law, New Veterinary College, 23, 80.  
 Value, comparative feeding of different foods according to their composition, 375.  
 Varieties of the ryegrass, 480.  
 Varnell, Professor, on fracture of the sesamoid bones of the off fore-leg of a horse, with luxation of the fetlock joint, 432.  
 Veterinarian, are we progressing? 582.  
 Veterinary education and the summer season, 335.  
 — jurisprudence, 33, 633.  
 — Records, by G. Armatage, V.S. to the Marchioness of Londonderry, 577, 626, 641.  
 Vitular fever, parturient fever, 501.



- |   |  |
|---|--|
| <p>Watson, Robert, M.R.C.V.S., on parturient apoplexy and metro-peritonitis, 1.</p> <p>White hellebore, effects of, on the horse, by G. Armatage, V.S., 651.</p> <p>Why animals to be eaten must be killed, 702.</p> <p>Worm in the eye of the horse, by T. Hickman, Esq., V.S., late Bengal Army, 652.</p> | <p>Worms and fibrinous concretions in the blood-vessels of horses and colts, by Seaman, 520.</p><br><p>Yield of hay, 436.</p> <p>—— of seed, 436.</p> <p>—— of straw, 436.</p> <p>—— of the green crop, 436.</p> |
|---|--|

## ERRATA IN NO LV.

- Page 649, line 10 from bottom, *for case read* carcase.
- „ 650, line 7 from bottom, *for men's read* mere.















most valuable b 492 Admired Room one  
Room Room

b 31 Link Room  
Meeting











